ORDER NO. ARD83010214C2-17

# Service Manual

Cassette Deck

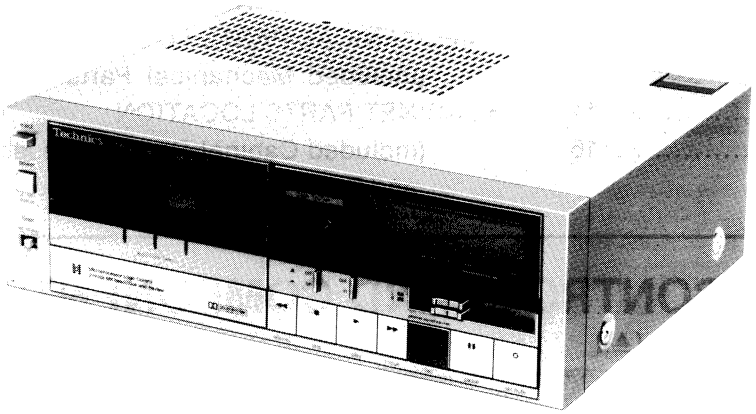
# RS-7

(Silver Face
Black Face)

## Microprocessor Controlled Cassette Deck with Auto Tape Selector

DOLBY SYSTEM

This is the Service Manual for the following areas.
Ⓓ ..... For all European areas except United Kingdom.



**RS-7 in black is also available in some countries.**

## RS-M250 MECHANISM SERIES

## Specifications

| | |
|---|---|
| Track system: | 4-track 2-channel stereo recording and playback |
| Tape speed: | 4.8cm/s |
| Wow and flutter: | 0.045% (WRMS), ±0.14% (DIN) |
| Frequency response: | Metal tape; 20—20,000Hz<br>30—18,000Hz (DIN)<br>50—17,000Hz ±3dB |
| | $CrO_2$ tape; 20—19,000Hz<br>30—18,000Hz (DIN)<br>50—16,000Hz ±3dB |
| | Normal tape; 20—18,000Hz<br>30—16,000Hz (DIN)<br>50—15,000Hz ±3dB |
| Signal-to-noise ratio: | Dolby* B NR in; 67dB (CCIR)<br>NR out; 57dB<br>(Signal level = max. input level A weighted, $CrO_2$ type tape) |
| Fast Forward and Rewind time: | Approx. 90 seconds with C-60 cassette tape |
| Inputs: | MIC; sensitivity 0.25mV, applicable microphone impedance 400Ω—10kΩ<br>LINE; sensitivity 60mV, input impedance 47kΩ or more |
| Outputs: | LINE; output level 400mV, output impedance 2kΩ or less |
| Bias frequency: | 80kHz |
| Heads: | 2-head system<br>1-MX head for record/playback<br>1-double-gap ferrite head for erasure |
| Motor: | 2-motor system |
| Power requirements: | AC; 220V, 50—60Hz |
| Power consumption: | 15W |
| Dimensions: | 31.5cm(W)×9.89cm(H)×24.5cm(D) |
| Weight: | 4kg |

Design & specifications are subject to change without notice.
*'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

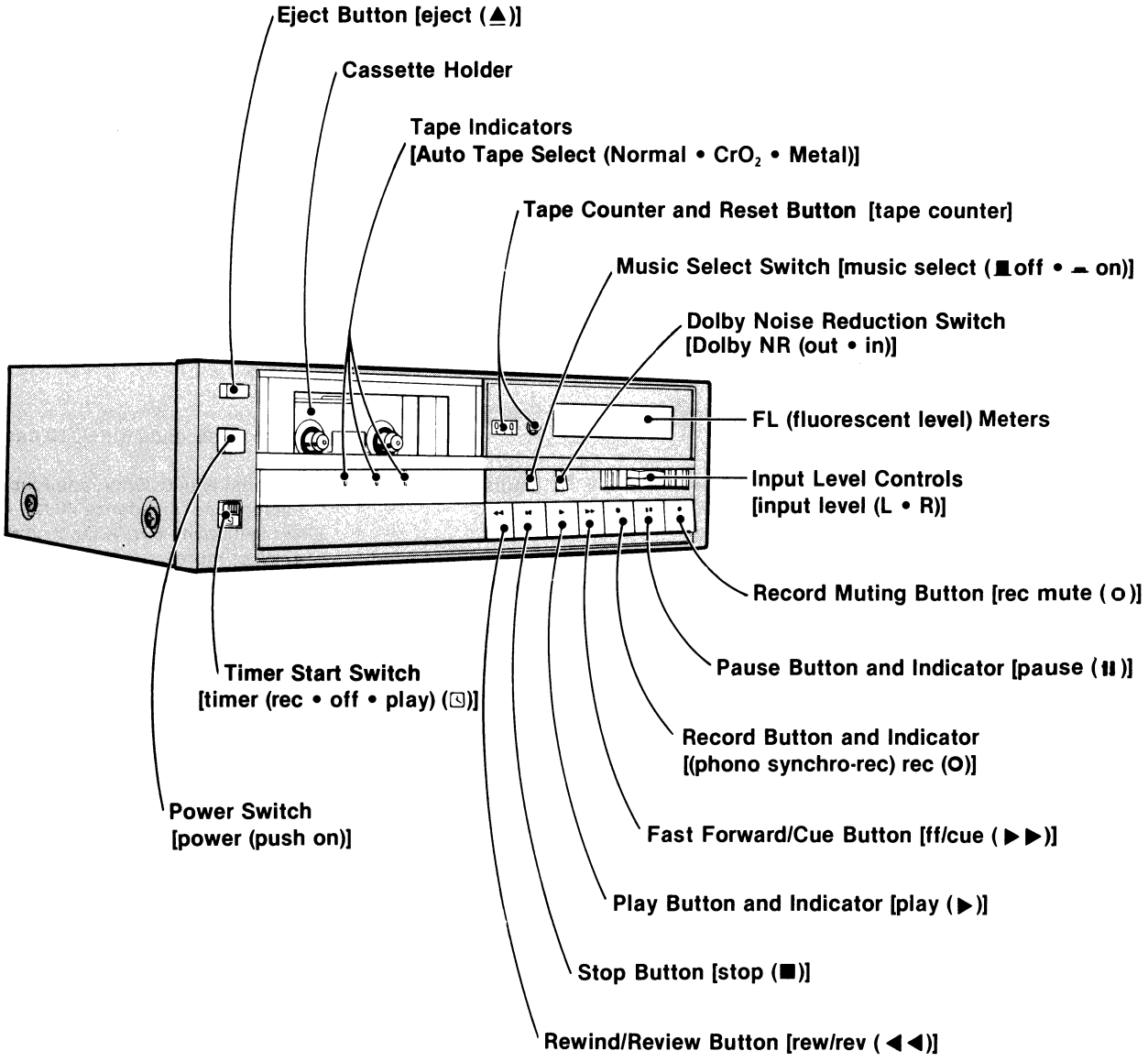
Technics

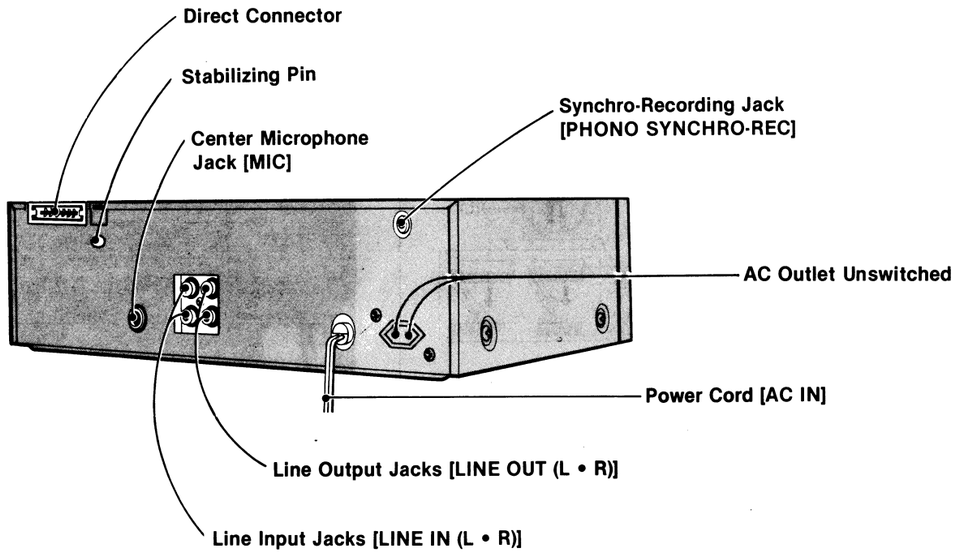
Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

# CONTENTS


| Item | Page |
|---|---|
| •LOCATION OF CONTROLS AND COMPONENTS | 2 |
| •FOR CONNECTION WITH THE DIRECT CONNECTOR | 3 |
| •OPERATING INSTRUCTION OF SYNCRO RECORDING | 4 |
| •DISASSEMBLY INSTRUCTION | 5 |
| •TECHNICAL EXPLANATION (SYNCRO RECORDING CIRCUITS) | 7 |
| •MEASUREMENT AND ADJUSTMENT METHODS | 9 |
| •MN14001RMA (IC401) EACH TERMINAL FUNCTION AND WAVEFORM | 14 |
| •BLOCK DIAGRAM | 16 |
| •SCHEMATIC DIAGRAM (for Main/Power Supply Circuit Section) | 19 |
| •SCHEMATIC DIAGRAM (for FL Meter Circuit Section) | 22 |
| •ELECTRICAL PARTS LIST | 23 |
| •SCHEMATIC DIAGRAM (for Mechanism/Mechanism Control/Leaf SW Circuit Section) | 24 |
| •CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM | 27 |
| •MECHANICAL PARTS LOCATION (included Mechanical Parts List) | 31 |
| •CABINET PARTS LOCATION (included Cabinet Parts, Accessories and Packing List) | 33 |


# LOCATION OF CONTROLS AND COMPONENTS

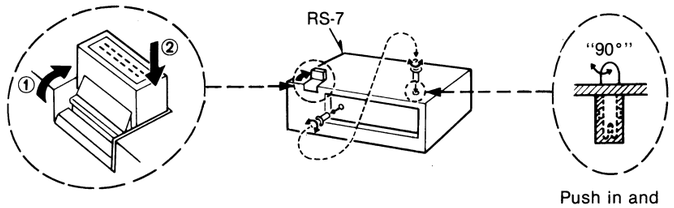

Eject Button [eject (▲)]
Cassette Holder
Tape Indicators
[Auto Tape Select (Normal • $CrO_2$ • Metal)]
Tape Counter and Reset Button [tape counter]
Music Select Switch [music select (off • on)]
Dolby Noise Reduction Switch
[Dolby NR (out • in)]
FL (fluorescent level) Meters
Input Level Controls
[input level (L • R)]
Record Muting Button [rec mute (o)]
Pause Button and Indicator [pause (II)]
Timer Start Switch
[timer (rec • off • play) ()]
Record Button and Indicator
[(phono synchro-rec) rec (O)]
Power Switch
[power (push on)]
Fast Forward/Cue Button [ff/cue (▶▶)]
Play Button and Indicator [play (▶)]
Stop Button [stop (■)]
Rewind/Review Button [rew/rev (◀◀)]


Direct Connector
Stabilizing Pin
Center Microphone Jack [MIC]
Synchro-Recording Jack [PHONO SYNCHRO-REC]
AC Outlet Unswitched
Power Cord [AC IN]
Line Output Jacks [LINE OUT (L • R)]
Line Input Jacks [LINE IN (L • R)]

# FOR CONNECTION WITH THE DIRECT CONNECTOR

- Connection can be made without using the Stereo Pin Cords when the unit and Technics Stereo Amplifier (with Direct Connector) and Stereo Tuner (ST-5) are stacked up for use.

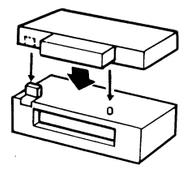
1




Set the Direct Connector to the erect position, replace the Stabilizing Pin at the unit's rear panel on the unit's top and connect the stereo amplifier properly.

Push in and turn 90° to lock in place

2



3 By following the above instructions, the Stereo Amplifier and the stereo Tuner are connected.
- To fold down the Direct Connector to its original position, first pull it straight up, the fold it down.

**Notes:**
- The Stereo Pin Cords must be detached when connection is made using the Direct Connector.
- Do not shake or twist the components since they will unnecessarilly stain the Direct Connector and Stabilizing Pin and may damage them process.



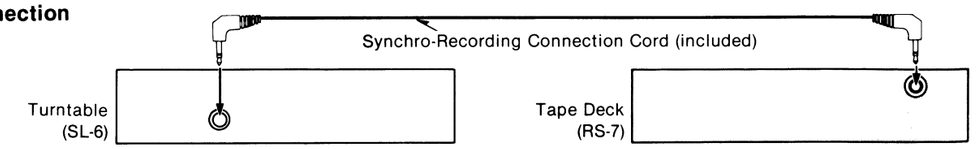


# OPERATING INSTRUCTION OF SYNCHRO RECORDING

## ■ What is Synchro-Recording?

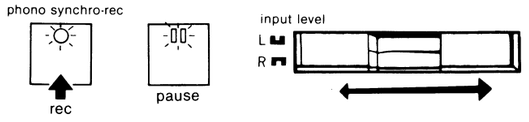
When the tape deck's Record Button is pushed, the deck is placed in the record-pause condition. When the stylus of the tonearm is lowered onto the record surface, the Pause Switch will be automatically released and recording will begin. When the stylus leaves the surface of the record, approximately four seconds of non-recorded interval will be allowed to pass before the recording stops automatically. This function is called synchro-recording.

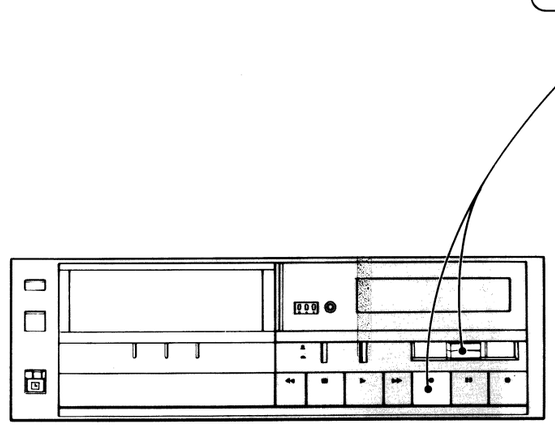
## ■ Connection




## ■ How to Perform Synchro-Recording

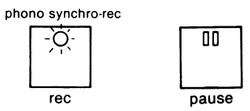
**1** Begin playing the record you want to record; push the tape deck's Record Button, and adjust the recording level.



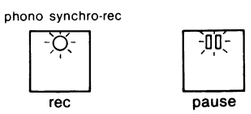



**2** Push the turntable's stop switch and stop the turntable. (The tonearm will return to the rest position.)

**3** Push the turntable's start switch , and begin the record play. When the stylus of the tonearm settles onto the record surface, the Pause Button will be automatically released (the Pause Indicator will go out) and recording will begin.




**4** When the stylus of the tonearm leaves the record surface, approximately four seconds of non-recorded interval will be allowed to pass and the tape deck's pause function will operate. (The Pause Indicator will light)




**Notes:**
- Depending on the condition of the outer part of the record, noise may occur from the stylus slipping as it settles onto the record surface. In order to create recordings without this noise, push the Record Muting Button until the stylus has fully settled onto the record surface.
- The Synchro-Recording Jack cannot be used on turntables other than those like the SL-6, etc., which have a synchro-recording jack attached to them. When recording from a source other than a record, stop the turntable before beginning to record from the other source. Also, do not operate the turntable while recording from another source, since the synchro-recording function will operate, thus stopping the recording from the other source.

**If the turntable is already rotating when you are recording from another source, and you only wish to stop the turntable, perform the following:**
- If the stylus is already on the record, press the turntable's stop switch while pressing the tape deck's Play Button.
- If the stylus is not on the record, press the "ON/OFF" switch to turn off the turntable, and turn it on again.

# DISASSEMBLY INSTRUCTION

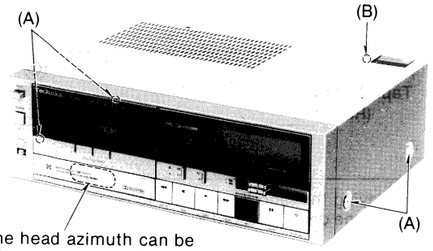



Fig. 1

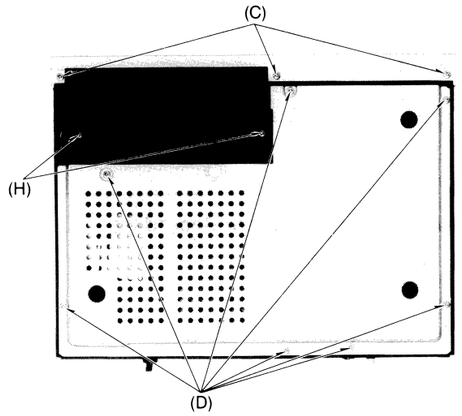



Fig. 2

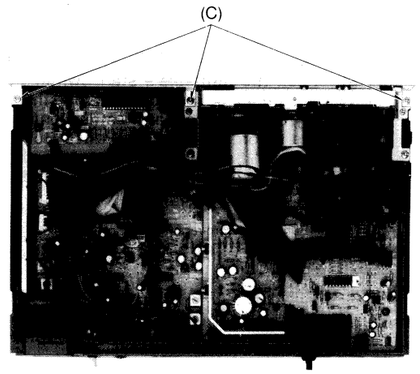



Fig. 3

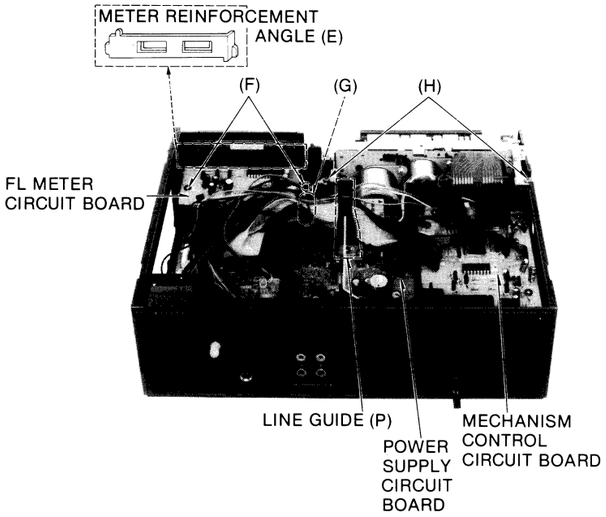



Fig. 4

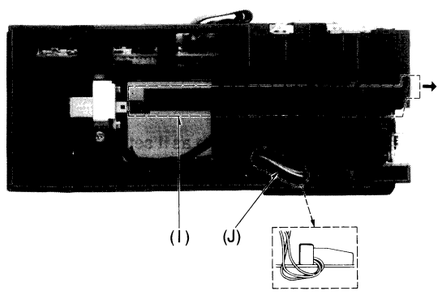



Fig. 5

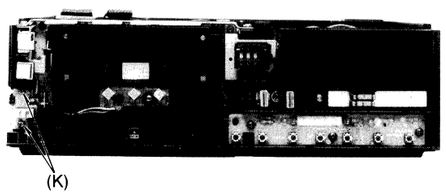



Fig. 6

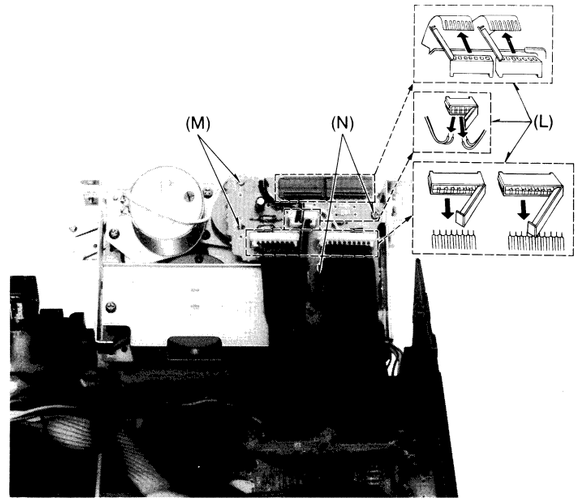



Fig. 7

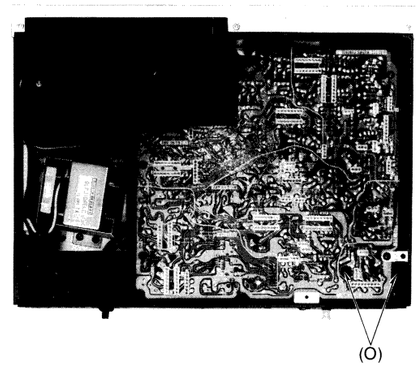



Fig. 8

| Ref. No. | Procedure | To remove —. | Remove —. | Shown in fig. —. |
|---|---|---|---|---|
| 1 | 1 | Case cover | • 4 screws .....(A)<br>• 1 black screw .....(B) | 1<br>1 |
| 2 | 1 → 2 | Front panel | • 6 screws .....(C)<br>(Open and remove the cassette lid before removing the front panel.) | 2, 3 |
| 3 | 3 | Bottom cover | • 7 screws .....(D) | 2 |
| 4 | 1 → 2 → 4 | FL meter circuit board | • Remove the meter reinforcement angle.....(E)<br>• 2 red screws.....(F)<br>• Remove the cord clamper .....(G) | 4<br>4<br>4 |
| 5 | 1 → 2 → 5 | Mechanism unit | • 4 screws .....(H)<br>• Remove the power button rod .....(I)<br>(To remove, pull in the dirrection of arrow.)<br>• Pull the cord to make it slacken.....(J)<br>• 2 screws .....(K) | 2, 4<br>5<br><br><br>5<br>6 |
| 6 | 1 → 2 → 5 → 6 | Mechanism circuit board | • Disconnect the wires from the connector.....(L)<br>(They can be disconnected by opening the connector cover.)<br>• Desolder the jumper wire .....(M)<br>• 2 screws .....(N) | 7<br><br><br>7<br>7 |
| 7 | 1 → 2 → 3 → 7 | Direct connector | • 2 screws .....(O) | 8 |

* To memove the power supply and mechanism control boards, first pull out the line guide [Fig. 4 (P)]. This makes it easy to handle the connections between the flat cables and others, and simplifies the operation.

# MESSUNGEN UND EINSTELL METHODEN

## RS-7 DEUTSCH

Verwenden Sie bitte diese Broschüre Zusammen mit der Service-Anieitung für das Modell Nr. RS-7.

**Anm.:** Wenn nicht anders vorgeschrieben, Drehschalter und Steuereinrichtungen auf die folgenden Positionen stellen.
- Für saubere Köpfe sorgen.
- Für saubere Tonwelle und Andruckrolle sorgen.
- Auf normale Raumtemperatur achten: 20±5°C (68±9°F)
- Timer-Startschalter: OFF
- Eingangsregler: MAX
- Dolbyschalter: AUS

**Ⓐ Senkrechtstellen des Kopfes**

Bedingung:
- Wiedergabe
- Betriebsart: Normalband

Meßgerät:
- Röhrenvoltmeter
- Oszillograph
- Testband (azimuth)...QZZCFM

**Ausgangsbalance-Justierung für linken und rechten Kanal**
1. Den Meßaufbau zeigt Fig. 2.
2. 8kHz-Signal des Testbandes (QZZCFM) wiedergeben.
   Schraube (B) in Fig. 3 auf maximalen Ausgangspegel des linken und rechten Kanals abgleichen
   Sind die Ausgangspegel des linken und rechten Kanals nicht gleichzeitig maximal, wie folgt justieren:
3. Durch Drehen der in Fig. 3 gezeigten Schraube (B) die Winkel A and C (Punkte, wo Spitzenausgangspegel für den linken und rechten Kanal erreicht werden) ermitteln. Anschließend den Winkel B zwischen dem Winkel A und C ermitteln, d.h. den Punkt, wo die Ausgangspegel des linken und rechten Kanals ausbalanciert (ausgeglichen) sind. (Siehe Fig. 3 und 4.)

**Phasenjustierung für linken und rechten Kanal**
4. Den Meßaufbau zeigt Fig. 5.
5. 8kHz-Signal des Testbandes (QZZCFM) wiedergeben.
   Schraube (B), wie in Fig. 3 gezeigt, so einstellen, daß Zeiger von zwei Röhrenvoltmeter auf Maximum ausschlagen und am Oszillographen eine Wellenform wie in Fig. 6 erreicht wird.

**Ⓑ Bandgeschwindigkeit**

Bedingung:
- Wiedergabe

Meßgerät:
- Elektronischer Digitalzähler
- Testband...QZZCWAT

**Genauigkeit der Bandgeschwindigkeit**
1. Den Meßaufbau zeigt Fig. 7.
2. Testband (QZZCWAT 3000Hz) wiedergeben und Ausgangssignal dem Zähler zuführen.
3. Frequenz messen.
4. Beträgt die auf dem Testband aufgezeichnete Frequenz 3000Hz, so ergibt sich die Genauigkeit nach folgender Formel:

$$\text{Genauigkeit der Bandgeschwindigkeit} = \frac{f-300}{3000} \times 100\,(\%)$$

   worin f die gemessene Frequenz ist.
5. Die Messung soll im mittleren Teil des Bandes erfolgen.

   **NORMALWERT: ±1,5%**

6. Falls der Meßwert nicht im vorgeschriebenen Bereich liegt, bitte mit Bandgeschwindigkeitsregler VR wie in Abb. 1 gezeigt einstellen.

**Anmerkung:** Bitte bei dieser Einheit zum Justieren der Bandgeschwindigkeit keinen Metallschraubenzieher benutzen.

**Schwankung der Bandgeschwindigkeit:**

Messung, wie oben beschrieben für Anfang, mittleren Teil und Ende des Testbandes wiederholen und Schwankung wie folgt bestimmen:

$$\text{Schwankung} = \frac{f_1-f_2}{3000} \times 100\,(\%)$$

$f_1$ = Maximalwert
$f_2$ = Minimalwert

**NORMALWERT: weniger als 1,0%**

**Ⓒ Frequenzgang bei Wiedergabe**

Bedingung:
- Wiedergabe
- Betriebsart "Normalband"

Meßgerät:
- Röhrenvoltmeter
- Oszillograph
- Testband...QZZCFM

**Messung:**
1. Den Meßaufbau zeigt Fig. 2.
2. Frequenzgang-Testband QZZCFM wiedergeben.
3. Ausgangsspannungen bei 315Hz, 12,5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz und 63Hz mit Ausgangsspannung der Standard-Frequenz 315Hz an den Testpunkten [TP3 (L-K), TP4 (R-K)] vergleichen.
4. Messungen an beiden Kanälen durchführen.
5. Prüfen, ob die Werte innerhalb der in Fig. 8 dargestellten Kurven liegen.

**Einstellung der Wiedergabefrequenz**
1. Unterbrechen oder Kurzschließen der Schaltungsanschlußpunkte zur Einstellung des Frequenzgangs bei Wiedergabe (siehe Fig. 9).
2. Bei Kurzschließen der Anschlußpunkte (A) (linker Kanal) und (A′) (rechter Kanal) wechselt die entsprechende Wiedergabefrequenz um die Werte wie unten beschrieben.
   Abweschselnde Kurzschließ-/Unterbrechbedingungen sind aufgrund der vor der Verschiffung vorgenommenen Feineinstellungen je nacht Gerät vershieden. Falls Nachstellungen enforderlich sind, sollten die Ergebnisse möglichst genau den Standardwerten entsprechen.

**Ⓓ Wiedergabe-Verstärkung**

Bedingung:
- Wiedergabe
- Betriebsart: Normalband

Meßgerät:
- Röhrenvoltmeter
- Oszillograph
- Testband...QZZCFM

1. Den meßaufbau zeigt Fig. 2.
2. Standard-Frequenz (QZZCFM 315Hz) vom Testband wiedergeben und Ausgangsspannung messen. [TP3 (L-CH), TP4 (R-CH)].
3. Messung an beiden Kanälen durchflühren.

   **NORMALWERT: 0,42V [0,42V±1dB (0,42V + 1dB≒0,47V, 0,42V−1dB≒0,37V): at LINE OUT Jack]**

**Einstellung:**
1. Abweichungen können durch Abgleich von VR3 (linker Kanal) und VR4 (rechter Kanal) korrigiert werden. (S. Fig. 1).
2. Nach erfolgtem Abgleich ist der Frequenzgang bei Wiedergabe erneut zu kontrollieren.

**Ⓔ Löschstrom**

Bedingung:
- Aufnahme
- Betriebsart: Metallband

Meßgerät:
- Röhrenvoltmeter
- Oszillograph

1. Den Meßaufbau zeigt Fig. 10.
2. Die Aufnahme-und Pausentaste drücken.
3. Den Bandwahlschalter auf Metallband-Position stellen.
4. Löschstrom nach folgender Formel emitteln:

$$\text{Löschstrom (A)} = \frac{\text{Die Spannung über beide Enden von R93}}{\text{1 (Ohm)}}$$

   **NORMALWERT: $150^{+15}_{-10}$mA (Metal position)**

5. Falls der Meßwert nicht im vorgeschriebenen Bereich liegt, auf folgende Weise einstellen.

**Einstellung:**
1. Die Stelle (C) unterbrechen und den Punkt (B) im Verdrahtungsplan auf der Hauptleiterplatte kurzschließen. (Siehe Seite 27.)
2. Den Löschstrom messen.
3. Beträgt der Löschstrom weniger als 140mA, den Punkt (C) kurzschließen.
4. Beträgt der Löschstrom mehr als 165mA, die Stellen (B) und (C) unterbrechen.

**Ⓕ Gesamtfrequenzgang**

Bedingung:
- Aufnahme und Wiedergabe
- Betriebsart "Normalband"
- Betriebsart "$CrO_2$ Band"
- Betriebsart "Metallband"
- Eingangsregler...MAX

Meßgerät:
- Röhrenvoltmeter
- NF-Generator
- Abschwächer
- Oszillograph
- Testband (Leerband)
  ...QZZCRA für Normal
  ...QZZCRX für $CrO_2$
  ...QZZCRZ für Metall
- Widerstand (600Ω)

**Anm.:**

Vor Messung und Abgleich des Gesamtfrequenzganges ist sicherzustellen, daß der Frequenzgang bei Wiedergabe korrekt ist (Vgl. entspr. Abschnitt).

**Gesamtfrequenzgang-Justierung durch Aufnahme-Vomagnetisierungsstrom**

(Der Aufnahme-Entzerrer ist fest eingestellt.)

1. Den Meßaufbau zeigt Fig. 12.
2. Gerät auf Betriebsart "Normalband" schalten, und Testband (QZZCRA) einlegen.
3. An LINE IN ein Signal von 1kHz, −24dB zuführen. Das Gerät auf Aufnahme schalten.
4. Den Dämpfungswiderstand feineinstellen, bis die Ausgangsleistung an LINE OUT 0,4V beträgt.
   - Überprüfen, daß der Signalausgangspegel bei einer Ausgangs-Spannung von 0,4V −24±4dB beträgt.
5. Mit dem NF-Oszillator Signale von 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz und 10kHz zuführen, und diese Signale auf das Testband aufzeichnen.
6. Die in Schritt 6 aufgezeichneten Signale wiedergeben und überprüfen, ob die Frequenzgangkurve innerhalb des Bereichs liegt, der im Frequenzgangdiagramm für normales Band in Fig. 11 gezeigt ist. (Falls die Kurve innerhalb des vorgeschriebenen Bereichs liegt, mit den Schritten 8, 9 und 10 weiterfahren.)
   Falls die Kurve außerthalb des vorgeschriebenen Bereichs liegt, wie folgt justieren.

   **Justierung (A):**

   Wenn die Kurve den vorgeschriebenen Gesamtfrequenzgangbereich (Fig. 11) überschreitet, wie in Fig. 13 gezeigt.
   1) Den Votmagnetisierungsstrom durch Abgleichen von VR7 (linker Kanal) und VR8 (rechter Kanal) erhöhen. (S. Fig. 1).
   2) Die Schritte 5 und 6 zur Überprüfung wiederholen. (Wenn die Kurve dabei innerhalb des vorgeschriebenen Bereichs liegt (Fig. 11) mit den Schritten 7, 8, und 9 weiterfahren.
   3) Wenn die Kurve den vorgeschriebenen Bereich (Fig. 11) noch immer überschreitet, den Vormagnetisierungsstrom weiter erhöhen, und die Schritte und wiederholen.

   **Justierung (B):**

   Wenn die Kurve unter den vorgeschriebenen Bereich für den Gesamtfrequenzgang (Fig. 11) absinkt, wie in Fig. 14 gezeigt:
   1) Den Vormagnetisierungsstrom durch abgleichen von VR7 (linker Kanal) und VR8 (rechter Kanal) reduzieren.
   2) Die Schritte 5 und 6 zur Überprüfung wiederholen. (Falls die Kurve dabei innerhalb des vorgeschriebenen Bereichs in Fig. 11 liegt, mit den Schritten 7, 8, und 9 weiterfahren.)
   3) Falls die Kurve noch immer unter den vorgeschriebenen Bereich (Fig. 11) absinkt, den Vormagnetisierungsstrom weiter reduzieren, und Schritte 5 und 6 wiederholen.
7. Gerät auf Betriebsart "$CrO_2$ Band" schalten.
8. Testband QZZCRX einlegen, und Signale von 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz und 12,5kHz aufzeichnen; Anschließend die Signale wiedergeben und prüfen, ob die Kurve innerhalb des Bereichs im Gesamtfrequenzgangdiagramm für $CrO_2$ band liegt. (Fig. 15).
9. Gerät auf Betriebsart "Metallband" schalten. Testband QZZCRZ einlegen und Signale von 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz und 12,5kHz aufnehmen. Anschließend die Signale wiedergeben und prüfen, ob die kurve innerhalb des Bereichs im Gesamtfrequenzgangdiagramm für Metallband liegt. (Fig. 15).
10. Überprüfen, daß die Vormagnetisierungsströme ungefähr den folgenden Werten entsprechen, wenn der Bandsortenschalter in die entsprechende Position gestellt ist.
    - Spannung zwischen Masse und Testpunkt (TP1 fur linken Kanal, TP2 für rechten Kanal) vom Röhrenvoltmeter ablesen und Vormagnetisierungsstrom nach folgender Formel berechnen:

$$\text{Vormagnetisierungsstrom (A)} = \frac{\text{Spannung am Röhrenvoltmeter (V)}}{10\ (\Omega)}$$

**Ungefähr 400μA (Normal position)**
**Ungefähr 510μA ($CrO_2$ position)**
**Ungefähr 820μA (Metall position)**

**Ⓖ Gesamtverstärkung**

Bedingung:
- Aufnahme und Wiedergabe
- Betriebsart: Normalband
- Eingangsregler: MAX
- Standard-Eingangspegel:
  Mikrofon .....−71±4dB
  NF-Eingang .....−24±3dB

Meßgerät:
- Röhrenvoltmeter
- NF-Generator
- Abschwächer
- Oszillograph
- Widerstand (600Ω)
- Testband (Leerband)
  ...QZZCRA für Normal

1. Den Meßaufbau zeigt Fig. 16.
2. Normales Testleerband (QZZCRA) einlegen.
3. Gerät auf "Aufnahme" schalten.
4. Über den Abschwächer ein 1kHz-Signal (−24dB) vom NF-Generator dem NF-Eingang zuführen.
5. Abschwächer so justieren, daß die Ausgangsspannung an den Testpunkten [TP3 (L-CH) TP4 (R-CH)] 0,42V erreicht. [0,42V±1dB (0,42V + 1dB≒0,47V, 0,42V−1dB≒0,37V) an der AUSGANGSBUCHSE].
6. Das aufgenommene Band abspielen und prüfen, ob der Ausgangspegel an den Testpunkten [TP3 (L-CH), TP4 (R-CH)] 0,42V erreicht.
7. Wenn der gemessene Wert nicht 0,42V erreicht, die folgenden VR abgleichen: VR5 (L-CH) oder VR6 (R-CH).
8. Ab Punkt 2 Wiederholen.

**Ⓗ Fluoreszenzmeter**

Bedingung:
- Aufnahme
- Eingangsregler...MAX

Meßgerät:
- Röhrenvoltmeter
- NF-Generator
- Abschwächer

1. Den Meßaufbau zeigt Fig. 16.
2. Einen Draht zwischen TP301 und TP302 (Siehe Fig. 17).
3. Signal von 1kHz (−24dB) an die LINE-IN Buchse eingeben und die Aufnahmetaste drücken.
4. Abschwächen so abstimmen, daß der Ausgangspegel an den Testpunkten [TP3 (L-CH), TP4 (R-CH) 0,42V wird. (Der Eingangspegel in dieser Stellung wird als Standardpegel bezeichnet).
5. Justierung auf "−20dB".
   A. Den Abschwächer so einstellen, daß der Eingangspegel −20dB des Stand-Aufnahmepegels beträgt.
   B. VR301 so abgleichen, daß im Bereich von −20dB±0,8dB das Segment −20dB aufleuchtet (NUR LINKER KANAL) (S. Fig. 18).
6. Justierung auf "0dB".
   A. Abschwächer so abstimmen, daß der Ausgangspegel an den Testpunkten [TP3 (L-CH), TP4 (R-CH)] Buchse, 0,42V wird.
   B. VR302 so abgleichen, daß im Bereich von 0±0,4dB um den Standardpegel das Segment +1dB aufleuchtet (S. Fig. 19).
7. Die Anleitungsschritte 5 bis 6 zweimal wiederholen.
8. Den Abschwächer einstellen; kontrollieren, ob alle Segmente aufleuchten, wenn der Eingangspegel 10dB höher als der Standardpegel ist (S. Fig. 20).
9. Verbindung zwischen TP301 und TP302 Masse, die in stufe 2 hergestellt wurde, unterbrechen.

**Ⓘ Dolby-Schaltung**

Bedingung:
- Aufnahme
- Eingangsregler...MAX

Meßgerät:
- Röhrenvoltmeter
- NF-Generator
- Abschwächer
- Oszillograph
- Widerstand (600Ω)

1. Den Meßaufbau zeigt Fig. 21.
2. Gerät auf "Aufnahme" stellen und Dolby-Schalter ausschalten. Dem NF-Eingang ein 5kHz-Signal zufübren, um an TP7 (Linker Kanal) und TP8 (Rechter Kanal) −34,5dB (18,8mV) zu erhalten.
3. Prüfen, ob das Signal bei eingeschaltetem Dolby-Schalter um 8 (±2) dB größer ist als bei ausgeschaltetem Dolby-Schalter.

**Ⓙ Einstellung der Zeitdauer des Scanning-Puls**

Bedingung:
- Stop

Meßgerät:
- Oszilloskop

1. Oszilloskop an Klemme 23 von IC401 anschließen.
2. Mit Oszilloskop die Zeit des Scanning-Puls wie in Fig. 22 dargestellt messen.

   **NORMALWERT: 7,2mSec—8,8mSec**
3. Falls der gemessene Wert vom unten gezeigten signal (Fig. 22) beträchtlich abweicht, wie folgt erforderliche Justierung vornehmen.

**Einstellung:**

1. Die Stelle (E) unterbrechen und den Punkt (D) im Verdrahtungsplan auf der Hauptleiterplatte kurzschließen. (Siehe Fig 23).
2. Jmpulslänge messen.
3. Überprüfen, ob der gemessene Jmpuls zwischen 8msec±0,8msec liegt.
4. Falls er außberhalb dieses Bereichs liegt, folgende Schritte ausführen.
   - Beträgt der Jmpuls weniger als 7,2 den Punkt (D) unterbrechen.
   - Beträgt der Löschstrom mehr als 8,8msec die Stelle (E) kurzschließen.

# METHODES DES MEASURES ET REGLAGES

## RS-7 FRANCAIS

Ceci est à utiliser conjointement avec le manuel d'entretien du modèle No. RS-7.

**REMARQUES:** Placer les interrupteurs et les contrôles dans les positions suivantes, sauf indication contraire.
- Vérifier que les têtes soient propres.
- Vérifier que le cabestan et le galet presseur soient propres.
- Température ambiante admissible: 20±5°C
- Interrupteur de démarrage de la minuterie: OFF
- Contrôles de niveau d'entrée: Maximum
- Interrupteur de réduction de bruit: OUT

### Ⓐ Réglage de l'azimut de tête

Condition:
- Mode de lecture
- Mode de bande normale

Equipement:
- Voltmètre électronique
- Oscilloscope
- Bande étalon (azimut) ...QZZCFM

**Réglage de l'équilibre de la sortie au canal gauche/canal droit**

1. Brancher les appareils comme indiqué dans la Fig. 2.
2. Reproduire le signal de 8kHz de la bande étalon (QZZCFM).
   Régler la vis (B) dans la Fig. 3 pour obtenir les niveaux de sortie maximum pour les canaux gauche et droit.
   Lorsque les niveaux de sortie des canaux gauche et droit ne sont pas simultanément à leur maximum, les régler à nouveau de la façon suivante.
3. Faire tourner la vis indiquée dans la Fig. 3 pour trouver les angles A et C (point où les niveaux de sortie de créte pour les canaux gauche et droit sont obtenus respectivment). Situer alors l'angle B entre les angles A et C, autrement dit, en un point où les niveaux de sortie des sortie des canaux gauche et droit atteignent tous deux leur maximum.
   (Voir les Fig. 3 et 4).

**Réglage de phase canal gauche/canal droit**

4. Brancher les appareils comme indiqué dans la Fig. 5.
5. Reproduire le signal de 8kHz de la bande étalon (QZZCFM).
   Régler la vis (B) indiquée dans la Fig. 3 de sorte que les aiguilles des deux voltmètres électroniques oscillent au maximum, et qu'on obtienne sur l'oscilloscope une forme d'onde semblable à celle indiquée dans la Fig. 6.

### Ⓑ Vitesse de défilement

Condition:
- Mode de lecture

Equipement:
- Fréquencemètre numérique
- Bande étalon...QZZCWAT

**Précision de la vitesse de défilement**

1. Brancher les appareils comme indiqué dans la Fig. 7.
2. Lire la bande étalon (QZZCWAT, 3000Hz) et appliquer le signal de lecture au fréquencemètre numérique.
3. Mesurer sa fréquence.
4. Sur la base de 3000Hz, déteminer la valeur à l'aide de la formule.

$$\text{Précision de vitesse} = \frac{f-3000}{3000} \times 100\ (\%)$$

avec f = valeur mesurée.

5. Effectuer la mesure sur la partie médiane de la bande.

**Valeur standard: ±1,5%**

6. Si la valeur mesurée ne correspond pas à la valeur standard, régler au moyen de la vis VR de réglage de la vitesse de défilement indiquee dans la Fig. 1.

**Remarque:** Utiliser un tournevis qui ne soit pas métallique pour le réglage de la précision de la vitesse de défilement sur cette unité.

**Fluctuations de vitesse de défilement**

Faire les mesures de la même façon que ci-dessus (au début, au milieu et en fin de bande) et déterminer la différence entre les valeurs maximale et minimale, puis calculer comme suit.

$$\text{Fluctuations de vitesse} = \frac{f_1-f_2}{3000} \times 100\ (\%)$$

$f_1$ = valeur maximale
$f_2$ = valeur minimale

**Valeur standard: inférieur à 1,0%**

### Ⓒ Réponse en fréquence à la lecture

Condition:
- Mode de lecture
- Mode de bande normale

Equipement:
- Voltmètre électronique
- Oscilloscope
- Bande étalon ...QZZCFM

**Mesure**

1. Brancher les appareils comme indiqué dans la Fig. 2.
2. Lire la portion de réponse en fréquence de la bande étalon (QZZCFM).
3. Mesurer les niveaux de sortie à 315Hz, 12,5kHz 8kHz, 4kHz, 1kHz, 250Hz, 125Hz, et 63Hz et comparer chaque niveau de sortie avec celui de la fréquence standard de 315Hz aux points de coupure (TP3 pour le canal gauche et TP4 pour le canal droit).
4. Effectuer les mesures sur les deux canaux.
5. Vérifier que les valeurs mesurées se situent dans la bande spécifiée de la courbe de réponse en fréquence. (Fig. 8).

**Réglage de la réponse en fréquence à la lecture**

1. Pour régler la réponse en fréquence à la lecture, ouvrir ou court-circuiter les points de connexion du circuit (voir Fig. 9).
2. Lorsque les points de connexion (A) (canal gauche) et (A') (canal droit) sont tous deux court-circuités, la réponse en fréquence change selon les valeurs indiquées dans le tableau 1 ci-dessous.
   Les conditions d'ouverture ou de court-circuitage des points de connexions varient selon les unités du fait de l'existence de différences dans les réglages de précision effectués avant l'expédition des appareils.
   Si un nouveau réglage devient nécessaire, ouvrir ou court-circuiter de sorte que les résultats soient aussi près que possible de la valeur standard.

### Ⓓ Gain à la lecture

Condition:
- Mode de lecture
- Mode de bande normale

Equipement:
- Voltmètre électronique
- Oscilloscope
- Bande étalon...QZZCFM

1. Brancher les appareils comme indiqué dans la Fig. 2.
2. Lire la partie "niveau standard d'enregistrement de la bande étalon (QZZCFM 315Hz) et, au moyen du voltmètre électronique, mesurer le niveau de sortie aux points de coupure [TP3 pour le canal gauche, TP4 pour le canal droit].
3. Effectuer les mesures sur les deux canaux.

**Valeur standard: 0,42V (0,42V±1dB (0,42 + 1dB≒0,47V, 0,42−1dB≒0,37V à la borne LINE OUT)**

**Réglage**

1. Si la valeur mesurée ne correspond pas à la valeur stansard régler VR3 (canal gauche) ou VR4 (canal droit). (Voir Fig. 1).
2. Après réglage, vérifier à nouveau la "réponse en fréquence à la lecture".

### Ⓔ Courant d'effacement

Condition:
- Mode d'enregistrement
- Mode de bande métallique

Equipement:
- Voltmètre électronique
- Oscilloscope

1. Brancher les appareils comme indiqué dans la Fig. 10.
2. Placer l'UNITE sur le mode de bande métallique.
3. Appuyer sur les boutons d'enregistrement et de pause.
4. Lire le voltage sur le voltmètre électronique et calculer le courant d'effacement au moyen de la formule suivante:

$$\text{Courant d'effacement (A)} = \frac{\text{Voltage à la résistance R93}}{1\ (\Omega)}$$

**Valeur standard: $150^{+15}_{-10}$mA (bande métallique)**

5. Si la valeur mesurée ne correspond pas à la valeur standard, régler selon les instructions ci-après.

**Réglage**

1. Ouvrir le point (C) et court-circuiter le point (B) sur la plaquette de circuit principale. Voir le schéma de câblage page 27.
2. Mesurer le courant d'effacement.
3. Si le courant d'effacement est inférieur à 140mA, court-circuiter le point (C).
4. Si le courant d'effacement est supérieur à 165mA, ouvrir les points (B) et (C).

### Ⓕ Résponse de fréq globale

**Remarque:**

Avant de mesurer et
(pout la méthode de
(Le compensateur d'
1. Brancher les app
2. Placer l'UNITE e
3. Appliguer le sign
4. Régler l'atténuat
   d'enregistremen
5. Régler l'oscillat
   enregistrer ces s
6. Reproduire les s
   limites indiquée
   (Si la courbe est
   Si la courbe ne
   **Réglage (A):**
   Lorsque la courb
   la Fig. 13.
   1) Augmenter le
      page 9).
   2) Répéter les p
      les spécificat
   3) Si la courbe
      phases 5 et 6
   **Réglage (B):**
   Lorsque la courb
   Fig. 14.
   1) Réduire le co
   2) Répéter les p
      les spécificat
   3) Si la courbe t
      et répéter les
7. Placer l'UNITE e
8. Enleverl la bande
   100Hz 200Hz, 50
   Reproduire ensu
   de fréquence glo
9. Placer l'UNITE e
   métallique), et e
   ensuite ces sign
   fréquence globa
10. Confirmer que le
    ses différentes p
    • Lire le voltage
      canal droit) et

Courant d

Val

### Ⓖ Gain global

**Ⓕ Résponse de fréquence globale**

Condition:
- Mode enregistrement/lecture
- Mode de bande normale
- Mode de bande $CrO_2$
- Mode de bande métallique
- Contrôles de niveau d'entrée...MAX

Equipement:
- Voltmètre électronique
- Atténuateur
- Oscillateur
- Oscilloscope
- Résistant (600Ω)
- Bande étalon vierge
  ...QZZCRA pour band normale
  ...QZZCRX pour bande $CrO_2$
  ...QZZCRZ pour bande métallique

**Remarque:**
Avant de mesurer et régler la résponse de fréquence globale vérifier que la réponse en fréquence à la lecture soit correcte (pout la méthode de mesure, se reporter au paragraphe infitulé "Réponse en fréquence à la lecture").
(Le compensateur d'enregistrement est fixe.)

1. Brancher les appareils comme indiqué dans la Fig. 12.
2. Placer l'UNITE en mode pour bande normale, et introduire la bande étalon vierge normale (QZZCRA).
3. Appliguer le signal de 1kHz de l'oscillateur AF à la loorne LINE IN, par l'intermédiaire de l'atténuateur.
4. Régler l'atténuateur de sorte que le niveau d'entrée soit de 20dB en-dessous du niveau d'enregistrement standard (niveau d'enregistrement standard = 0VU).
5. Régler l'oscillateur AF pour produire des signaux de 50Hz 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz et 10kHz et enregistrer ces signaux sur la bande étalon.
6. Reproduire les signaux enregistrés dans la phase 6, et vérifier si la courbe de réponse de fréquence se trouve dans les limites indiquées par la courbe de réponse de fréquence globale pour bandes normales (Fig. 11).
   (Si la courbe est comprise dans les spécifications, passer aux phases 7, 8 et 9).
   Si la courbe ne correspond pas aux spécifications du tableau, régler comme suit.

   **Réglage (A):**

   Lorsque la courbe dépasse les spécifications du tableau de réponse de fréquence globale (Fig. 11), comme indiqué dans la Fig. 13.
   1) Augmenter le courant de polarisation en tournant VR7 (L-CH) (canal gauche) et VR8 (R-CH) (canal droit). (Voir Fig. 1 page 9).
   2) Répéter les phases 5 et 6 pour confirmation. (Passer aux phases 7, 8 et 9 si la courbe est maintenant comprise dans les spécifications du tableau de la Fig. 11).
   3) Si la courbe dépasse encore les spécifications (Fig. 11), augmenter encore le courant de polarisation et répéter les phases 5 et 6.

   **Réglage (B):**

   Lorsque la courbe tombe audessous des spécifications du tableau de fréquence globale (Fig. 11) comme indiqué dans la Fig. 14.
   1) Réduire le courant de polarisation en tournant VR7 (L-CH) (canal gauche) et VR8 (R-CH) (canal droit).
   2) Répéter les phases 5 et 6 pour confirmation. (Passer aux phases 7, 8 et 9 si la courbe est maintenant comprise dans les spécifications du tableau de la Fig. 11).
   3) Si la courbe tombe encore au-dessous des spécifications du tableau (Fig. 11), réduire encore le courant de polarisation et répéter les phases 5 et 6.
7. Placer l'UNITE en mode de bande $CrO_2$.
8. Enleverl la bande étalon vierge normale et placer la bande étalon QZZCRX (bande $CrO_2$). Enregistrer les signaux de 50Hz, 100Hz 200Hz, 500Hz 1kHz, 4kHz, 8kHz, 10kHz et 12,5kHz.
   Reproduire ensuite ces signaux et vérifier si la courbe est comprise dans les limites indiquées par le tableau de réponse de fréquence globale pour les bandes $CrO_2$ (Fig. 15).
9. Placer l'UNITE en mode de bande métallique, changer la bande étalon pour la bande étalon vierge QZZCRZ (bande métallique), et enregistrer les signaux de 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz en 12,5kHz. Reproduire ensuite ces signaux, et vérifier si la courbe est comprise dans les limites indiquées par le tableau de réponse de fréquence globale pour les bandes métalliques (Fig. 15).
10. Confirmer que les courants de polarisation sont approximativement les suivants lorque le sélecteur de bande est mis sur ses différentes positions.
    - Lire le voltage sur le voltmètre électronique entre la terre et le point de coupure (TP1 pour le canal gauche et TP2 pour le canal droit) et calculez le courant de polarisation selon la formule.

$$\text{Courant de polarisation (A)} = \frac{\text{Tension lue sur voltm. élec. (V)}}{10\ (\Omega)}$$

| | |
|---|---|
| Valeur standard: | **Autour de 400μA (position: Normal)**<br>**Autour de 510μA (position: $CrO_2$)**<br>**Autour de 820μA (position: Metal)** |

**Ⓖ Gain global**

Condition:
- Mode d'enregistrement/lecture
- Mode de bande normale
- Contrôles de niveau d'entrée ...MAX
- Niveau d'entrée standard:
  MIC .....−71±4dB
  LINE IN .....−24±3dB

Equipement:
- Voltmètre électronique
- Oscillateur AF
- Atténuateur
- Oscilloscope
- Résistance (600Ω)
- Bande étalon vierge QZZCRA pour bande normale

1. Brancher les les appareils comme indiqué dans la Fig. 16.
2. Introduire la bande étalon vierge (QZZCRA).
3. Placer l'UNITE en mode d'enregistrement.
4. Appliquer le signal de 1kHz de l'oscillateur AF à la borne LINE IN, par l'intermédiaire de l'atténuateur (−24dB).
5. Régler l'atténuateur pour que le niveau de contrôle aux points de coupure [TP3 pour le canal gauche, TP4 pour le canal droit] soit de 0,42V. [0,42V±1dB (0,42V + 1dB≒0,47V, 0,42V−1dB≒0,37V) aux bornes LINE OUT].
6. Lire la bande ainsi enregistrée et vérifier que le niveau de sortie aux points de coupure [TP3 pour le canal gauche, TP4 pour le canal droit] soit de 0,42V.
7. Si la valeur mesurée n'est pas de 0,42V, régler au moyen de VR5 (canal gauche) ou VR6 (canal droit).
8. Recommencer à partir de la phase (2).

**Ⓗ Vumètre fluonescent**

Condition:
- Mode d'enregistrement
- Contrôles de niveau d'entrée ...MAX

Equipement:
- Voltmètre électronique
- Atténuateur
- Oscillateur AF

1. Brancher les appareils comme indiqué sur la Fig. 16.
2. Brancher un câble entre le point de coupure TP301 et TP302 (Voir Fig. 17).
3. Appliquer le signal de 1kHz à la borne LINE IN, par l'intermédiaire de l'atténuateur (−24dB). Placer ensuite l'unité sur le mode d'enregistrement.
4. Régler l'atténuateur de sorte que le niveau de sortie aux points de coupure [TP3 pour le canal gauche, TP4 pour le canal droit] soit de 0,42V.
   (Le niveau d'entrée sous cette condition s'appelle alors le niveau d'entrée standard).
5. Réglage à "−20dB"
   A. Régler l'atténuateur de sorte que le niveau d'entrée soit de −20dB en-dessous du niveau d'entrée standard.
   B. Régler VR301 de sorte que le segment −20dB du vumètre fluorescent s'allume lorsque le niveau d'entrée est de 20±0,8dB en-dessous du niveau d'entrée standard (CANAL GAUCHE SEULEMENT). (Voir Fig. 18).
6. Réglage à "0dB"
   A. Régler l'atténuateur de sorte que le niveau de sortie aux points de coupure [TP3 pour le canal gauche, TP4 pour le canal droit] soit de 0,42V (0V: à la borne LINE OUT).
   B. Régler VR302 de sorte gue le segment + 1dB du vumètre fluorescent s'allume lorsque le niveau d'entrée se trouve dans une plage de 0±0,4dB par rapport au niveau d'entrée standard. (Voir Fig. 19).
7. Répéter deux fois les phases (5) et (6) ci-dessus.
8. Régler l'atténuateur et vérifier que tous les segments du vumètre s'allument lorsque le signal d'entrée est augmenté de 10dB au-dessus du niveau d'entrée standard. (Voir Fig. 20).
9. Débrancher le câble entre le point de coupure TP301 et TP302 (câble que l'on avait branché à la phase 2).

**Ⓘ Circuit de réduction de bruit Dolby**

Condition:
- Mode d'enregistrement
- Contrôles de niveau d'entrée ...MAX

Equipement:
- Voltmètre électronique
- Oscillateur AF
- Atténuateur
- Oscilloscope
- Résistance (600Ω)

1. Brancher les appareils comme indiqué dans la Fig. 21.
2. Placer l'UNITE sur le mode d'enregistrement et régler l'interrupteur de réduction de bruit Dolby sur la position OUT. Appliquer une signal de 5kHz à la borne LINE IN afin d'obtenir −34,5dB (18,8mV) aux points de coupure TP7 (canal gauche) et TP8 (canal droit).
3. Vérifier que les valeurs aux points de coupure TP7 et TP8, lorsque l'interrupteur de réduction de bruit Dolby est sur la position IN, sont de 8 (±2) dB plus élevées que les valeurs aux mêmes points lorsque l'interrupteur de réduction de bruit DOLBY est sur la position OUT.

**Ⓙ Réglage de la durée de balayage d'entrée**

Condition:
- Mode d'arrêt

Equipement:
- Oscilloscope

1. Brancher l'oscilloscope à la borne 23 de IC401.
2. Mesurer la durée du signal de balayage d'entrée au moyen de l'oscilloscope, comme l'indique la Fig. 22.

   **Valeur standard: 7,2msec—8,8msec**

3. Si la valeur mesurée est sensiblement différente de la valeur du signal indiquée ci-dessous, effectuer les réglages nécessaires suivants.

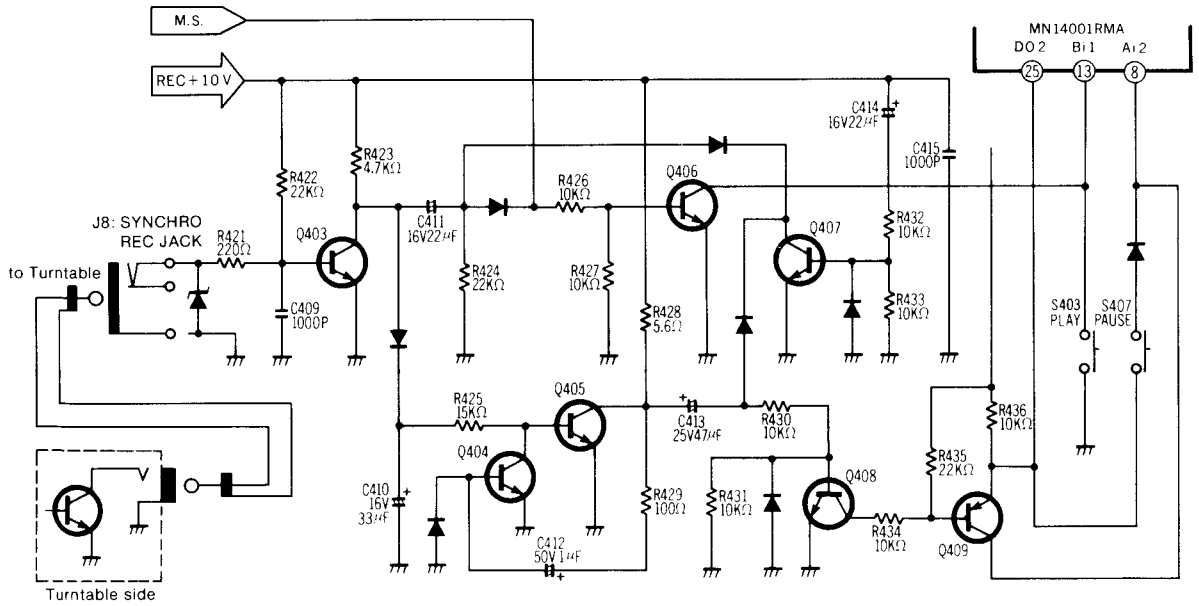
**Réglage**

1. Ouvrir le point (E) et court-circuiter le point (D) sur la plaquette de circuit principale (Voir Fig. 23).
2. Mesurer la valeur de la forme d'onde.
3. S'assurer que la valeur mesurée se trouve entre 8msec±0,8msec.
4. Si elle se situe en dehors de cette plage, procéder aux réglages suivants.
   - Si la valeur mesurée est inférieure à 7,2msec, ouvrir le point (D).
   - Si la valeur mesurée est supérieure à 8,8msec, court-circuiter le point (E).

# TECHNICAL EXPLANATION

## Synchro-Recording Circuit

**Outline:** This circuit provides mode switching between "recording start" and "recording pause" when the unit is connected with turntable equipped with a synchro REC terminal, such as SL-6.



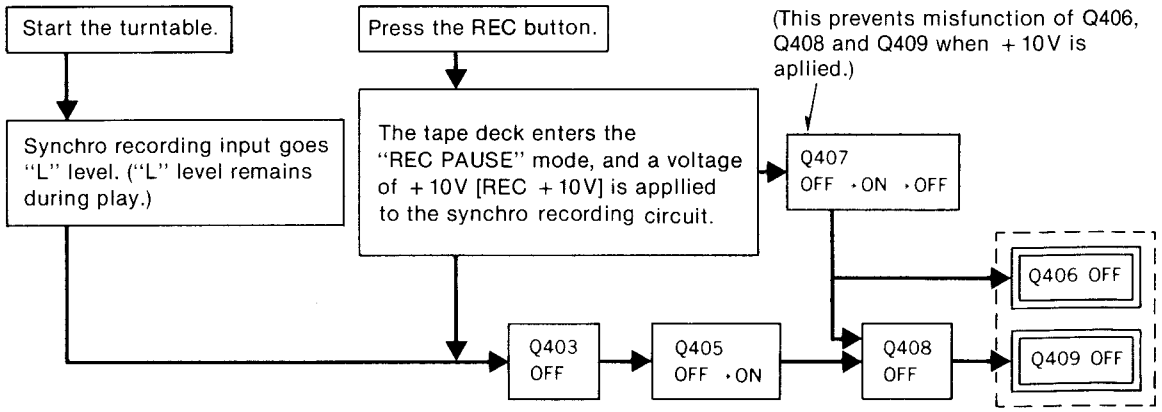

When the REC button is pressed, the REC PAUSE mode is effected. When the PLAY button is pressed then, the REC PLAY mode is effected. When the PAUSE button is pressed, the REC PAUSE is effected.

* When the PAUSE button is pressed in the REC PAUSE mode, nothing is unchanged.

**Control**

1. When the REC button is pressed after the record begins, REC PAUSE is effected. The recording level should be adjusted properly during this time.

**Operation**

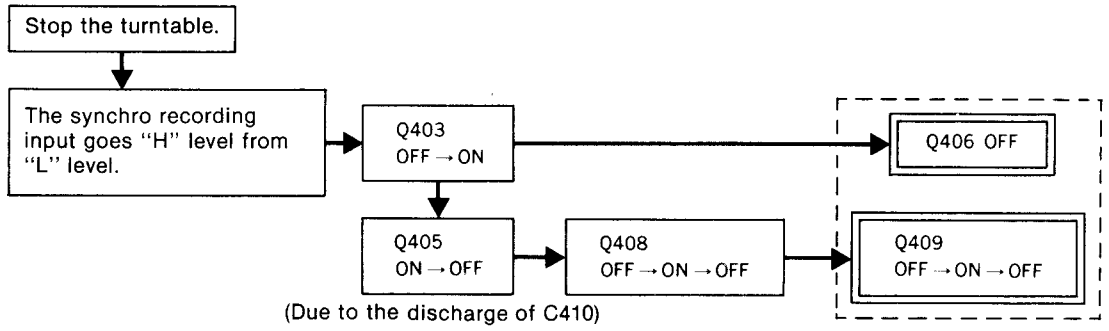

Start the turntable.
Press the REC button.
(This prevents misfunction of Q406, Q408 and Q409 when +10V is apllied.)
Synchro recording input goes "L" level. ("L" level remains during play.)
The tape deck enters the "REC PAUSE" mode, and a voltage of +10V [REC +10V] is appllied to the synchro recording circuit.
Q407 OFF →ON →OFF
Q406 OFF
Q409 OFF
Q403 OFF
Q405 OFF →ON
Q408 OFF

As above, when the REC button is pressed during record play, the deck enters the "REC PAUSE" mode.
At the same time, Q406 and Q409 in the recording circuit is OFF, so that the REC PAUSE mode does not change.
(This is to make the synchro recording circuit interlock with the turntable.)

**Control**

2. Press the stop clear button of the turntable.
   (The tonearm returns to the start position.)

**Operation**

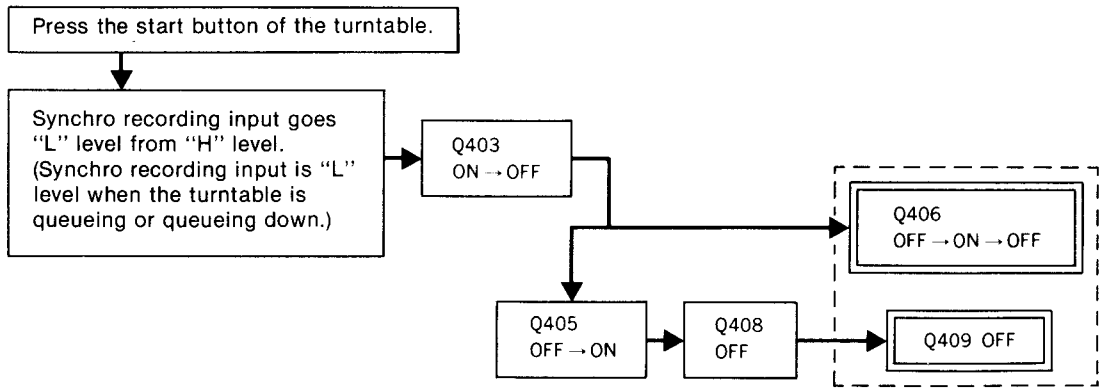

Stop the turntable.
The synchro recording input goes "H" level from "L" level.
Q403 OFF → ON
Q406 OFF
Q405 ON → OFF
Q408 OFF → ON → OFF
Q409 OFF → ON → OFF
(Due to the discharge of C410)

The deck stays in the REC PAUSE mode.

**Control**

3. Press the start button of the turntable to start the record.
   • When the tonearm stylus lands on the record, the REC PAUSE button is released (the REC PAUSE indicator lamp goes off), and recording begins.

**Operation**

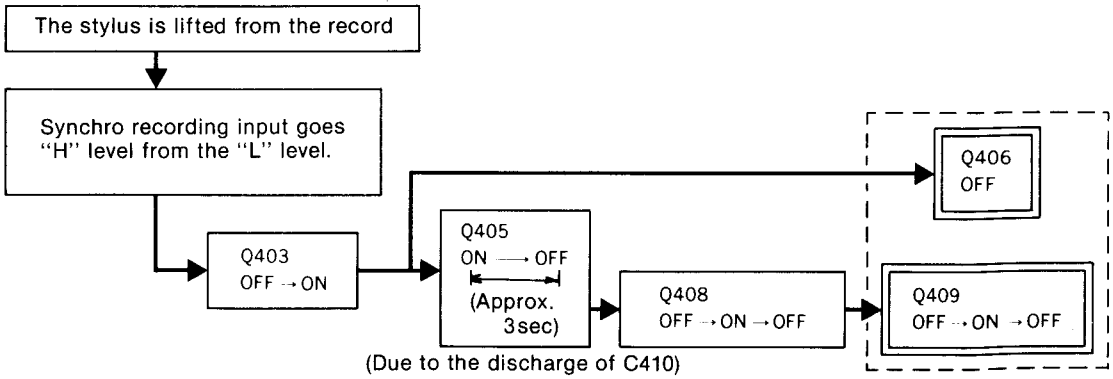

Press the start button of the turntable.
Synchro recording input goes "L" level from "H" level. (Synchro recording input is "L" level when the turntable is queueing or queueing down.)
Q403 ON → OFF
Q406 OFF → ON → OFF
Q405 OFF → ON
Q408 OFF
Q409 OFF

With Q406 turned ON, the deck changes its mode from REC PAUSE to REC PLAY.

**Control**

4. When the tonearm stylus is lifted from the record, no-signal portion for about 4 seconds is created, and then the deck enters the REC PAUSE mode.
   The REC PAUSE indicator lamp also lights.)

**Operation**


The stylus is lifted from the record
Synchro recording input goes "H" level from the "L" level.
Q403 OFF → ON
Q405 ON → OFF (Approx. 3sec)
Q406 OFF
Q408 OFF → ON → OFF
Q409 OFF → ON → OFF
(Due to the discharge of C410)

• About 4 seconds later, the deck changes its mode form the "REC PLAY" to "REC PAUSE".
  Note) Q404, C412 and R429 improves operation to allow quicker switching.

# MEASUREMENT AND ADJUSTMENT METHODS

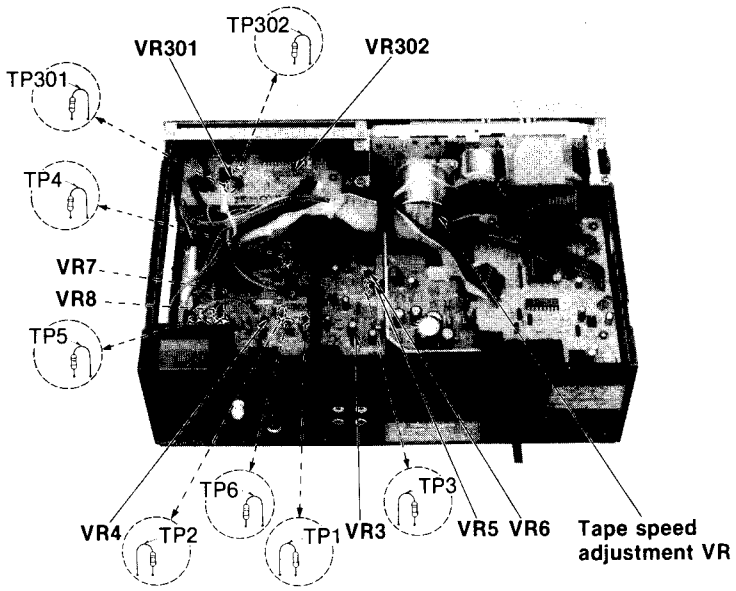



Fig. 1

**NOTES:** Set switches and controls in the following positions, unless otherwise specified.

- Make sure heads are clean
- Make sure capstan and pressure roller are clean
- Judgeable room temperature 20±5°C (68±9°F)
- Timer start switch: OFF
- Input level controls: Maximum
- NR switch: OUT

**Ⓐ Head azimuth adjustment**

Condition:
- Playback mode
- Normal tape mode

Equipment:
- VTVM
- Oscilloscope
- Test tape (azimuth)...QZZCFM

**L-CH/R-CH output balance adjustment**

1. Make connections as shown in fig. 2.

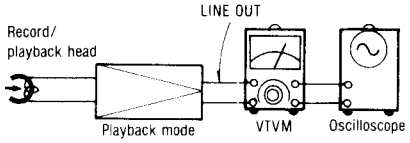



Fig. 2

2. Playback the 8kHz signal from the test tape (QZZCFM). Adjust screw (B) in fig. 3 for maximum output L-CH and R-CH levels. When the output levels of L-CH and R-CH are not at maximum at the same point adjust as follows.
3. Turn screw (B) shown in fig. 3 to find angles A and C (points where peak output levels for left and right channels are obtained). Then, locate angle B between angles A and C, i.e., point where L-CH and R-CH outputs are balanced. (Refer to figs. 3 and 4.)

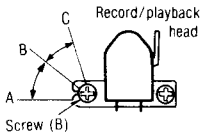



Fig. 3

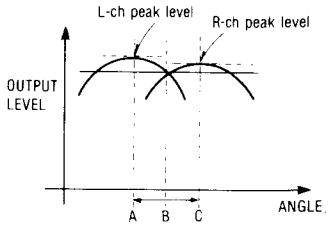



Fig. 4

**L-CH/R-CH phase adjustment**

4. Make connections as shown in fig. 5.
5. Playback the 8kHz signal from the test tape (QZZCFM). Adjust screw (B) shown in fig. 3 so that pointers of the two VTVMs swing to maximum and a lissajous waveform as illustrated in fig. 6 is obtained on the oscilloscope.

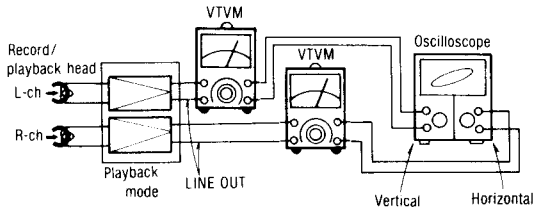



Fig. 5

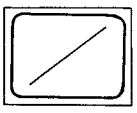


Fig. 6

## Ⓑ Tape speed

Condition:
- Playback mode

Equipment:
- Digital frequency counter
- Test tape...QZZCWAT

**Tape speed accuracy**

1. Test equipment connection is shown in fig. 7.
2. Playback test tape (QZZCWAT 3,000Hz), and supply playback signal to the digital frequency counter.
3. Measure this frequency.
4. On the basis of 3,000Hz, determine value by following formula:

$$\text{Tape speed accuracy} = \frac{f-3{,}000}{3{,}000} \times 100(\%)$$ where, f = measured value

5. Take measurement at middle section of tape.

**Standard value: ±1.5%**

6. If measured value is not within the standard value, adjust it by using the tape speed adjustment VR shown in Fig. 1.
   **Note:** Please use non metal type screwdriver when you adjust tape speed accuracy on this unit.

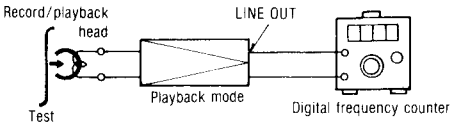



Fig. 7

**Tape speed fluctuation**

Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows:

$$\text{Tape speed fluctuation} = \frac{f_1-f_2}{3{,}000} \times 100(\%)$$ $f_1$ = maximum value, $f_2$ = minimum value

**Standard value: Less than 1%**

## Ⓒ Playback frequency response

Condition:
- Playback mode
- Normal tape mode

Equipment:
- VTVM
- Oscilloscope
- Test tape...QZZCFM

**Measurement**

1. Test equipment connection is shown in fig. 2.
2. Playback the frequency response portion of test tape (QZZCFM).
3. Measure output level at 315Hz, 12.5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz and 63Hz, and compare each output level with the standard frequency 315Hz, at test points [TP3 (L-CH), TP4 (R-CH)].
4. Make measurements for both channels.
5. Make sure that the measured values are within the range specified in the frequency response chart (fig. 8).

**Playback frequency response chart**

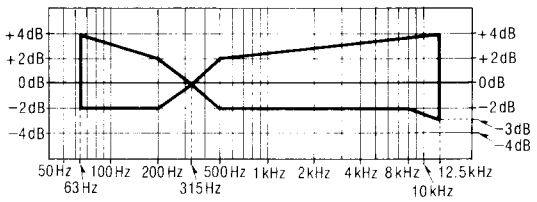



Fig. 8

**Playback frequency response adjustment**

1. Open or short the circuit's connection points to adjust playback frequency response (see fig. 9).
2. When each connection points (A) (L-CH) and (A') (R-CH) are shorted, the frequency response changes by values as described below (table 1).
   Short/open conditions, in turn, differ with sets due to the differences in fine adjustments made prior to shipping. If readjustments are required, set conditions so that results are as close to the standard value as possible.

| 6kHz | 8kHz | 10kHz | 12.5kHz |
|---|---|---|---|
| around +0.2dB | around +0.4dB | around +1.0dB | around +1.5dB |

Table 1

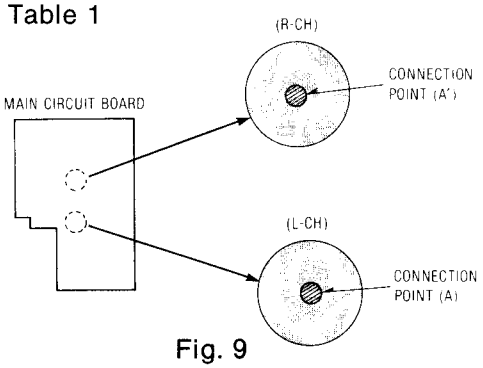



Fig. 9

**Ⓓ Playback gain**

Condition:
- Playback mode
- Normal tape mode

Equipment:
- VTVM
- Oscilloscope
- Test tape...QZZCFM

1. Test equipment connection is shown in fig. 2.
2. Playback standard recording level portion on test tape (QZZCFM 315Hz) and, using VTVM, measure the output level at test points [TP3 (L-CH), TP4 (R-CH)].
3. Make measurements for both channels.

**Standard value: 0.42V [0.42V±1dB (0.42V+1dB≒0.47V, 0.42V−1dB≒0.37V): at LINE OUT jack]**

**Adjustment**
1. If the measured value is not within the standard adjust VR3 (L-CH) or VR4 (R-CH) (See fig 1).
2. After adjustment, check "Playback frequency response" again.

**Ⓔ Erase current**

Condition:
- Record mode
- Metal tape mode

Equipment:
- VTVM
- Oscilloscope

1. Test equipment connection is shown in fig. 10.
2. Place UNIT into metal tape mode.
3. Press the record and pause buttons.
4. Read voltage on VTVM and calculate erase current by following formula:

$$\text{Erase current (A)} = \frac{\text{Voltage across resistor R93}}{1\ (\Omega)}$$

**Standard value: $150^{+15}_{-10}$mA (Metal)**

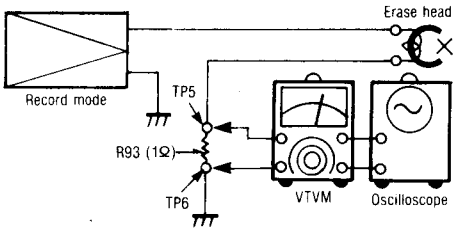



Fig. 10

5. If the measured value is not within the standard value adjust it by following the adjustment instructions.

**Adjustment**
1. Open point (C) and short point (B) on the main circuit board. Refer to the wiring connection diagram on page 27.
2. Measure the erase current.
3. If the erase current is less than 140mA, short the point (C).
4. If the erase current is more than 165mA, open the points (B) and (C).

**Ⓕ Overall frequency response**

Condition:
- Record/playback mode
- Normal tape mode
- $CrO_2$ tape mode
- Metal tape mode
- Input level controls...MAX

Equipment:
- VTVM
- ATT
- AF oscillator
- Oscilloscope
- Resistor (600Ω)
- Test tape (reference blank tape)
  ...QZZCRA for Normal
  ...QZZCRX for $CrO_2$
  ...QZZCRZ for Metal

**Note:**
Before measuring and adjusting, the overall frequency response make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response).

(Recording equalizer is fixed)
1. Make connections as shown in fig. 12.
2. Place UNIT into normal tape mode and insert the normal reference blank test tape (QZZCRA).
3. Supply a 1kHz signal from the AF oscillator through ATT to LINE IN.
4. Adjust ATT so that input level is −20dB below standard recording level (standard recording level = 0 VU).
5. Adjust the AF oscillator frequency to 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz and 10kHz signals, and record these signals on the test tape.
6. Playback the signals recorded in step 6, and check if the frequency response curve is within the limits shown in the overall frequency response chart for normal tapes (fig. 11).
   (If the curve is within the charted specifications, proceed to steps 7, 8 and 9.)
   If the curve is not within the charted specifications, adjust as follows;

**Overall frequency response chart (Normal)**

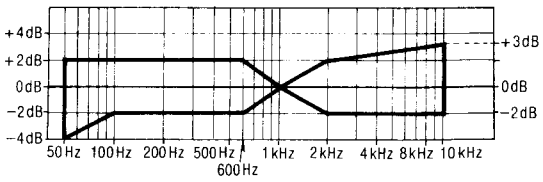



Fig. 11

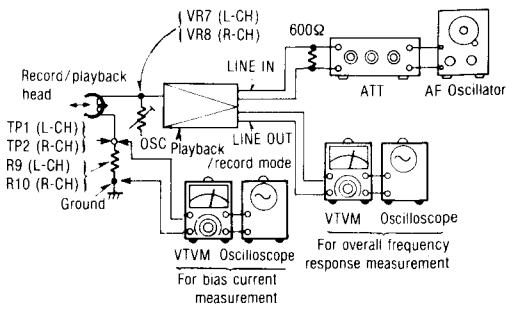



Fig. 12

**Adjustment (A):**

When the curve exceeds the overall specified frequency response chart (fig. 11) as shown in fig. 13.

1) Increase bias current by turning VR7 (L-CH) and VR8 (R-CH). (See fig. 1 on page 9.)
2) Repeat steps 5 and 6 for confirmation (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown fig. 11.)
3) If the curve still exceeds the specifications (fig. 11), increase bias current further and repeat steps 5 and 6.

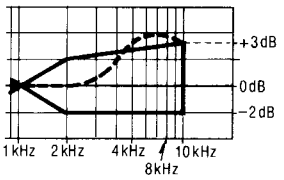



Fig. 13

**Adjustment (B):**

When the curve falls below the overall specified frequency response chart (fig. 11) as shown in fig. 14.

1) Reduce bias current by turning VR7 (L-CH) and VR8 (R-CH).
2) Repeat steps 5 and 6 for confirmation (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown fig. 11.)
3) If the curve still falls below the charted specifications (fig. 11), reduce bias current further and repeat steps 5 and 6.

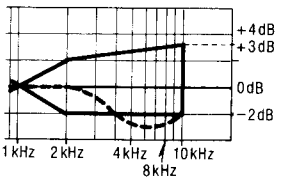



Fig. 14

7. Place UNIT into $CrO_2$ tape mode.
8. Change test tape to $CrO_2$ reference blank test tape (QZZCRX), and record 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz and 12.5kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart or $CrO_2$ tapes (fig. 15).
9. Place UNIT into metal tape mode and change test tape to metal reference blank test tape (QZZCRZ), and record 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz and 12.5kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for metal tapes (fig. 15).
10. Confirm that bias currents are approximately as follows when the UNIT is set at different tape mode.
    - Read voltage on VTVM between ground and test point (TP1 for L-CH, TP2 for R-CH) and calculate bias current by following formula:

$$\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10\ (\Omega)}$$

| | |
|---|---|
| | **around 400μA (Normal position)** |
| **Standard value:** | **around 510μA ($CrO_2$ position)** |
| | **around 820μA (Metal position)** |

**Overall frequency response chart ($CrO_2$, Metal)**

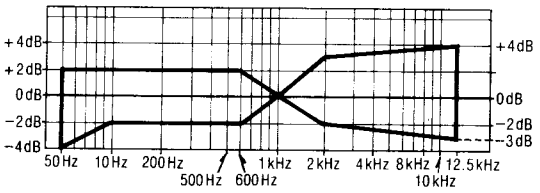



Fig. 15

## G Overall gain

Condition:
- Record/playback mode
- Normal tape mode
- Input level controls...MAX
- Standard input level;
  MIC .....−71±4dB
  LINE IN .....−24±3dB

Equipment:
- VTVM
- AF oscillator
- ATT
- Oscilloscope
- Resistor (600Ω)
- Test tape (reference blank tape) ...QZZCRA for Normal

1. Test equipment connection is shown in fig. 16.
2. Insert the normal reference blank tape (QZZCRA).
3. Place UNIT into record mode.
4. Supply a 1kHz signal through ATT (−24dB) from AF oscillator, to LINE IN.
5. Adjust ATT until monitor level at test points [TP3 (L-CH), TP4 (R-CH)] becomes 0.42V [0.42V±1dB (0.42V + 1dB≒0.47, 0.42V−1dB≒0.37V) at test LINE OUT jack].
6. Playback recorded tape, and make sure that the output level at test points [TP3 (L-CH), TP4 (R-CH)] becomes 0.42V [0.42V±1dB (0.42V + 1dB≒0.47V, 0.42V−1dB≒0.37V) at test LINE OUT jack].
7. If measured value is not 0.42V, adjust it by using VR5 (L-CH) or VR6 (R-CH).
8. Repeat from step (2).

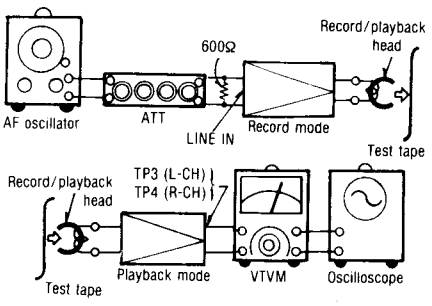



Fig. 16

## H Fluorescent meter

Condition:
- Record mode
- Input level controls...MAX

Equipment:
- VTVM
- ATT
- AF oscillator

1. Test equipment connection is shown in fig. 16.
2. Connect a wire between TP301 and TP302 (See fig. 17)
3. Supply a 1kHz signal through ATT (−24dB) to the LINE IN jack, then place the unit into the record mode.

4. Adjust the ATT so that the output level at test points [TP3 (L-CH), TP4 (R-CH)] becomes 0.42V [0.42V±1dB (0.42V+1dB≒0.47V, 0.42V−1dB≒0.37V): at LINE OUT jacks] (The input level at this condition is called the standard input level).
5. Adjustment at "−20dB":
   A. Adjust the ATT so that input level is −20dB below the standard input level.
   B. Adjust VR301 so that the −20dB segment of the FL meter lights up with the input level of −20±0.8dB below the standard input level (L-CH ONLY) (See fig. 18).
6. Adjustment at "0dB".
   A. Adjust the ATT so that the output level at test points [TP3 (L-CH), TP4 (R-CH)] becomes 0.42V.
   (The input level at this condition is called the standard input level).
   B. Adjust VR302 so that the +1dB segment of the FL meter lights up with the input level of 0±0.4dB range of the standard input level (See fig. 19).
7. Repeat twice between steps (5) and (6) above.
8. Adjust ATT and check that all segments light up when an input signal level is increased to 10dB higher than the standard input level (See fig. 20).
9. Disconnect the wire between TP301 and TP302 terminal, which had been connected at step 2.

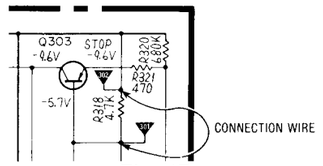


Fig. 17

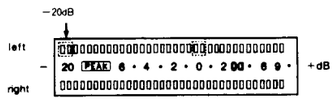


Fig. 18

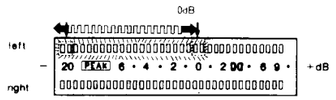


Fig. 19

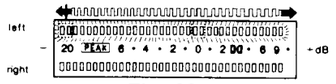


Fig. 20

**❶ Dolby NR circuit**

Condition:
- Record mode
- Input level controls...MAX

Equipment:
- VTVM
- AF oscillator
- ATT
- Oscilloscope
- Resistor (600Ω)

1. Test equipment connection is shown in fig. 21.
2. Place UNIT into record mode, set the Dolby NR switch to OUT position and supply a 5kHz signal to LINE IN to obtain −34.5dB (18.8mV) at TP7 (L-CH), TP8 (R-CH).
3. Confirm that the values at test points TP7, TP8 with Dolby NR switch in the IN position are 8 (±2)dB greater than the values at the OUT position of the Dolby NR switch.

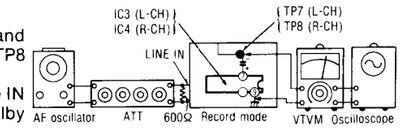


Fig. 21

**❷ Input scanning time adjustment**

Condition:
- Stop mode

Equipment:
- Oscilloscope

1. Connect an oscilloscope to terminal 23 of IC401.
2. Measure the time of the input scanning signal with an oscilloscope as shown in fig. 22.

**Standard value: 7.2msec—8.8msec**

3. If the measured value is different from the signal shown (fig. 22) make the necessary adjustment as follows:

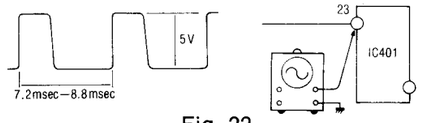


Fig. 22

**Adjustment**

1. Open point (E) and short point (D) on the main circuit board (See fig. 23).
2. Measure the wave form.
3. Make sure that the measured value is within 8msec±0.8msec.
4. If it is beyond the specified value, carry out the following adjustments:
   - If the measured value is less than 7.2msec, short the point (D).
   - If the measured value is more than 8.8msec, open the point (E).

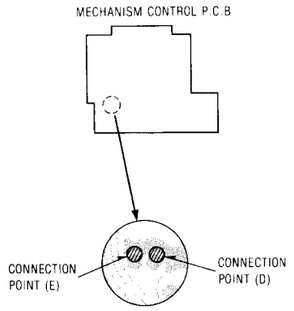
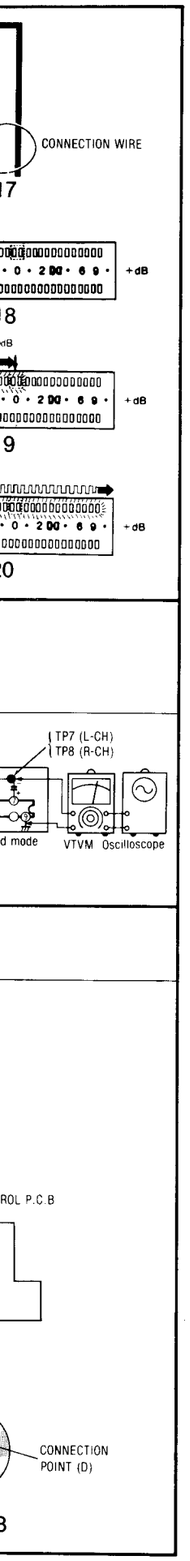


Fig. 23



# MN14001RMA (IC401) EACH TERMINAL FUNCTION AND WAVEFORM

| Terminal No. | Symbol | Name | Function/operation |
|---|---|---|---|
| 1 | Vss | GND | |
| 2 | CO9 | BIAS Control | ○ Goes to H immediately after REC or PAUSE operation.<br>○ Remains in H during REC or PLAY operation.<br>○ Goes to L approximately 85msec after the STOP command is given.<br>REC command / STOP command / REC • PAUSE mode / Approx. 85msec. |
| 3 | CO8 | DMT (Muting) | ○ Goes to L approximately 0.4sec after PLAY operation.<br>○ Remains in H in the PAUSE, FF, REW, or STOP mode.<br>○ Goes to L approximately 0.5sec after the REC command is given.<br>○ Goes to L approximately 0.18sec after CUE or REV operation is begun.<br>Power ON / PLAY mode / Approx. 0.6sec. / Approx. 0.4sec. |
| 4 | CO7 | REC Indication | ○ Goes to H when the REC command is given.<br>○ Goes to H immediately after power is supplied in the TIMER REC mode.<br>○ Remains in H if the TIMER REC mode is selected when the automatic STOP return mechanism functions at power on.<br>○ Goes to L approximately 0.15sec after the STOP command is given in the REC, PAUSE, or REC PLAY mode.<br>REC command / STOP command / Approx. 0.15sec. |
| 5 | CO6 | PLAY Indication | ○ Goes to H when the PLAY command is given.<br>○ Goes to H in the TIMER REC or TIMER PLAY mode.<br>PLAY command / STOP command |
| 6 | CO5 | PAUSE Indication | ○ Goes to H when the PAUSE or REC command is given.<br>PAUSE command / STOP command |
| 7 | Ai3 | Reading of input switch state | ○ Reads switch state according to the scanning of DOϕ—3. (Accidental eracing protection leaf switch S501 and PAUSE switch). |
| 8 | Ai2 | Reading of input switch state | ○ Reads switch state according to the scanning of DOϕ—3. (Mode detection leaf switch S502, REC switch). |
| 9 | Ai1 | Reading of input switch state | ○ Reads switch state according to the scanning of DOϕ—3. (PLAY position detection leaf switch S503, TIMER PLAY switch, CUE, REVIEW switch). |
| 10 | Aiϕ | Reading of input switch state | ○ Reads switch state according to the scanning of DOϕ—2. (STOP position detection leaf switch S503, TIMER REC switch). |
| 11 | Bi3 | REW key switch | ○ Goes to L when switch is pressed (normal H). Switch is pressed |
| 12 | Bi2 | FF key switch | ○ Goes to L when switch is pressed (normal H). Switch is pressed |
| 13 | Bi1 | PLAY key switch | ○ Goes to L when switch is pressed (normal H). Switch is pressed |
| 14 | Biϕ | STOP key switch | ○ Goes to L when switch is pressed (normal H). Switch is pressed |
| 15 | EOϕ | | |
| 16 | EO1 | | |
| 17 | EO2 | | |
| 18 | EO3 | | |
| 19 | TST | | |
| 20 | RST | | |
| 21 | SNSϕ | | |
| 22 | SNS1 | | |
| 23 | DOϕ | | |
| 24 | DO1 | | |
| 25 | DO2 | | |
| 26 | DO3 | | |
| 27 | VDD | | |
| 28 | OSC | | |



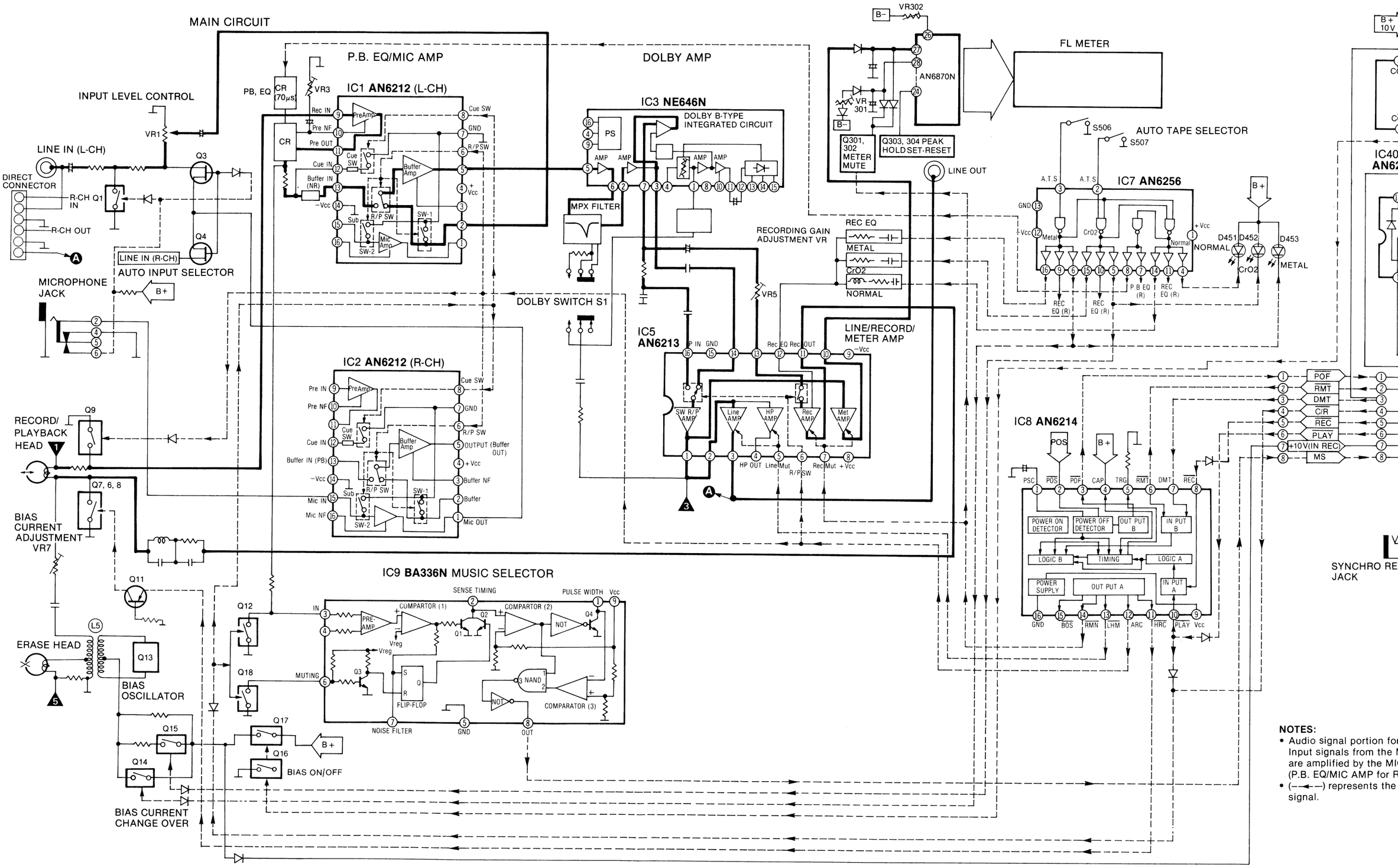

# MN14001RMA (IC401) EACH TERMINAL FUNCTION AND WAVEFORM

| Terminal No. | Symbol | Name | Function/operation |
|---|---|---|---|
| 1 | Vss | GND | |
| 2 | CO9 | BIAS Control | ○ Goes to H immediately after REC or PAUSE operation.<br>○ Remains in H during REC or PLAY operation.<br>○ Goes to L approximately 85msec after the STOP command is given.<br>REC command / STOP command / REC • PAUSE mode / Approx. 85msec. |
| 3 | CO8 | DMT (Muting) | ○ Goes to L approximately 0.4sec after PLAY operation.<br>○ Remains in H in the PAUSE, FF, REW, or STOP mode.<br>○ Goes to L approximately 0.5sec after the REC command is given.<br>○ Goes to L approximately 0.18sec after CUE or REV operation is begun.<br>Power ON / PLAY mode / Approx. 0.6sec. / Approx. 0.4sec. |
| 4 | CO7 | REC Indication | ○ Goes to H when the REC command is given.<br>○ Goes to H immediately after power is supplied in the TIMER REC mode.<br>○ Remains in H if the TIMER REC mode is selected when the automatic STOP return mechanism functions at power on.<br>○ Goes to L approximately 0.15sec after the STOP command is given in the REC, PAUSE, or REC PLAY mode.<br>REC command / STOP command / Approx. 0.15sec. |
| 5 | CO6 | PLAY Indication | ○ Goes to H when the PLAY command is given.<br>○ Goes to H in the TIMER REC or TIMER PLAY mode.<br>PLAY command / STOP command |
| 6 | CO5 | PAUSE Indication | ○ Goes to H when the PAUSE or REC command is given.<br>PAUSE command / STOP command |
| 7 | Ai3 | Reading of input switch state | ○ Reads switch state according to the scanning of DOϕ—3. (Accidental eracing protection leaf switch S501 and PAUSE switch). |
| 8 | Ai2 | Reading of input switch state | ○ Reads switch state according to the scanning of DOϕ—3. (Mode detection leaf switch S502, REC switch). |
| 9 | Ai1 | Reading of input switch state | ○ Reads switch state according to the scanning of DOϕ—3. (PLAY position detection leaf switch S503, TIMER PLAY switch, CUE, REVIEW switch). |
| 10 | Aiϕ | Reading of input switch state | ○ Reads switch state according to the scanning of DOϕ—2. (STOP position detection leaf switch S503, TIMER REC switch). |
| 11 | Bi3 | REW key switch | ○ Goes to L when switch is pressed (normal H). Switch is pressed |
| 12 | Bi2 | FF key switch | ○ Goes to L when switch is pressed (normal H). Switch is pressed |
| 13 | Bi1 | PLAY key switch | ○ Goes to L when switch is pressed (normal H). Switch is pressed |
| 14 | Biϕ | STOP key switch | ○ Goes to L when switch is pressed (normal H). Switch is pressed |



| Terminal No. | Symbol | Name | Function/operation |
|---|---|---|---|
| 15 | EOϕ | Brake solenoid output | ○ Goes to H in the FF, REW, CUE or REV mode.<br>FF command / STOP command |
| 16 | EO1 | Trigger solenoid output | ○ Remains in H after input of the mechanism selection command (PLAY, PAUSE, STOP, etc.) and until mode detection leaf switch is closed. (H period is approximately 75msec although it differs according to mechanism state.)<br>Command / Approx. 75msec. |
| 17 | EO2 | Reel motor rotation output (Reverse): counterclockwise rotation | ○ Remains in H from command input until mode detection leaf switch S502 opens during mechanism mode selection.<br>Command / Approx. 250msec.<br>○ Goes to H in REW and REV modes.<br>REW command |
| 18 | EO3 | Reel motor rotation output (Forward): clockwise rotation | ○ The above description is applicable during mode selection.<br>○ Remains in H in FF or CUE mode. |
| 19 | TST | IC test terminal | ○ Normally connected to GND. |
| 20 | RST | Reset terminal | ○ Goes to H approximately 0.6sec after power on to start computer.<br>Power ON / Approx. 0.6sec. |
| 21 | SNSϕ | Rotation detection input | ○ Accepts Hall IC output according to reel table rotation. |
| 22 | SNS1 | | ○ Non connection. |
| 23 | DOϕ | Input switch scanning | Approx. 8msec.<br>DOϕ T1 T5<br>DO1 T2 T6<br>DO2 T3 T7<br>DO3 T4 T8<br>Tb Ta<br>Pulse width Ta = 1.8msec Tb = 200μsec. |
| 24 | DO1 | | |
| 25 | DO2 | | |
| 26 | DO3 | | |
| 27 | VDD | Power supply terminal | ○ Functions at 4.5—6.0V (normally 5.4V). |
| 28 | OSC | Oscillation terminal | ○ Generates oscillation at approximately 300—350kHz.<br>• Because the connection of a probe affects the terminal, nothing should be connected to this terminal for any other measurements.<br>• Use Dϕ to 3 in measuring the computer's velocity; Approx. 125Hz in STOP condition.<br>3V / 1V / Approx. 2.7μsec. |

# BLOCK DIAGRAM




**NOTES:**

- Audio signal portion for L-CH is sho
  Input signals from the MICROPHON
  are amplified by the MIC AMP circu
  (P.B. EQ/MIC AMP for R-CH), howev
- (—◄—) represents the flow of the
  signal.

DOLBY AMP

IC3 **NE646N**
DOLBY B-TYPE INTEGRATED CIRCUIT
PS
AMP AMP AMP AMP
MPX FILTER

VR302
AN6870N
VR 301
Q301, 302 METER MUTE
Q303, 304 PEAK HOLD SET-RESET
FL METER

LINE OUT

S506
S507
AUTO TAPE SELECTOR

IC7 **AN6256**
A.T.S A.T.S
GND Vcc Metal CrO2 Normal +Vcc
P.B EQ (R)
REC EQ (R)
REC EQ (R)

B+
D451 D452 D453
NORMAL CrO2 METAL

RECORDING GAIN ADJUSTMENT VR
REC EQ
METAL
CrO2
NORMAL
VR5

LBY SWITCH S1

IC5 **AN6213**
P IN GND Rec EQ Rec OUT -Vcc
SW R/P AMP
Line AMP
HP AMP
Rec AMP
Met AMP
HP OUT Line Mut R/P SW Rec Mut +Vcc

LINE/RECORD/ METER AMP

IC8 **AN6214**
POS
B+
PSC POS POF CAP TRG RMT DMT REC
POWER ON DETECTOR
POWER OFF DETECTOR
OUT PUT B
IN PUT B
LOGIC B
TIMING
LOGIC A
POWER SUPPLY
OUT PUT A
IN PUT A
GND BOS RMN LHM ARC HRC PLAY Vcc

POF
RMT
DMT
C/R
REC
PLAY
+10V(IN REC)
MS

TOR
PULSE WIDTH Vcc
NOT Q4
COMPARATOR (3)

MECHANISM CONTROL

B+ 10V
Q401
OSC
CO8
RST
IC401 **MN14001RMA**
MICRO COMPUTER
DO2 DO3 DOØ
CO9 CO5 CO6 CO7 EOϕ EO1 EO2 EO3
SNSØ BiØ Bi1 Bi2 Bi3
Ai3 Ai2 Ai1 Aiϕ

IC402
**AN6270**
REEL MOTOR CONTROL

S409 TIMER
MUSIC SELECT
REC INH
MODE
PLAY
STOP
S408
S501 S502 S504 S503

Q409
Q406
B+
Q402
HALF SWITCH
STOP
PLAY
FF
REW
REC
PAUSE
S505
S402 S403 S404 S405 S406 S407

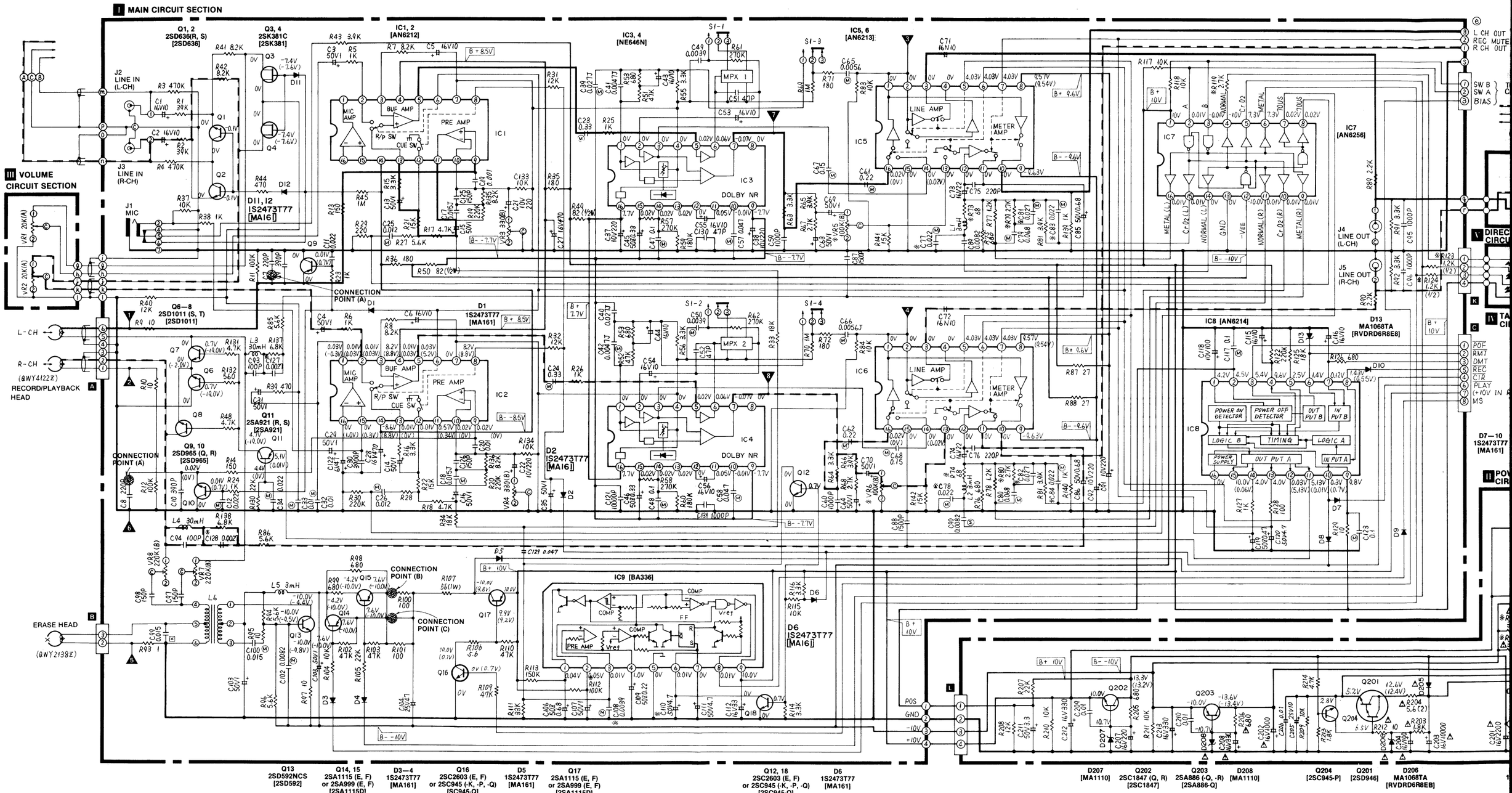
TRIGGER PLUNGER
BRAKE PLUNGER
B+
B−
M
REEL MOTOR
CAPSTAN MOTOR
IC501
HALL IC
REC MUTE SWITCH
S401
D413 PAUSE
D415 REC
D414 PLAY

B+
Q403 SHAPER (REC • PLAY)
Q407 RESET
SYNCHRO REC JACK
Q404, 405, 408 (REC • PAUSE)
SYNCHRO REC CIRCUIT

B+ 10V
B+ 5.4V
B+ 13V
B− 13.7V
Q204
Q201
J7
AC OUTLET
POS
B+ 10V
B− −10V
TO MAIN CIRCUIT
Q202
Q203
RECTIFIER
D201—204
F1
F2
T1
S2
F3
AC IN
B+ 10V
B− −10V
AC 3V
TO FL METER
REGULATED POWER SUPPLY

**NOTES:**
- Audio signal portion for L-CH is shown here. Input signals from the MICROPHONE JACK are amplified by the MIC AMP circuit in IC2 (P.B. EQ/MIC AMP for R-CH), however.
- (—◄—) represents the flow of the control signal.

# SCHEMATIC DIAGRAM
## (for Main/Power Supply Circuit Section)




Q13 2SD592NCS [2SD592]

Q14, 15 2SA1115 (E, F) or 2SA999 (E, F) [2SA1115D]

D3—4 1S2473T77 [MA161]

Q16 2SC2603 (E, F) or 2SC945 (-K, -P, -Q) [SC945-Q]

D5 1S2473T77 [MA161]

Q17 2SA1115 (E, F) or 2SA999 (E, F) [2SA1115D]

Q12, 18 2SC2603 (E, F) or 2SC945 (-K, -P, -Q) [2SC945-Q]

D6 1S2473T77 [MA161]

D207 [MA1110]

Q202 2SC1847 (Q, R) [2SC1847]

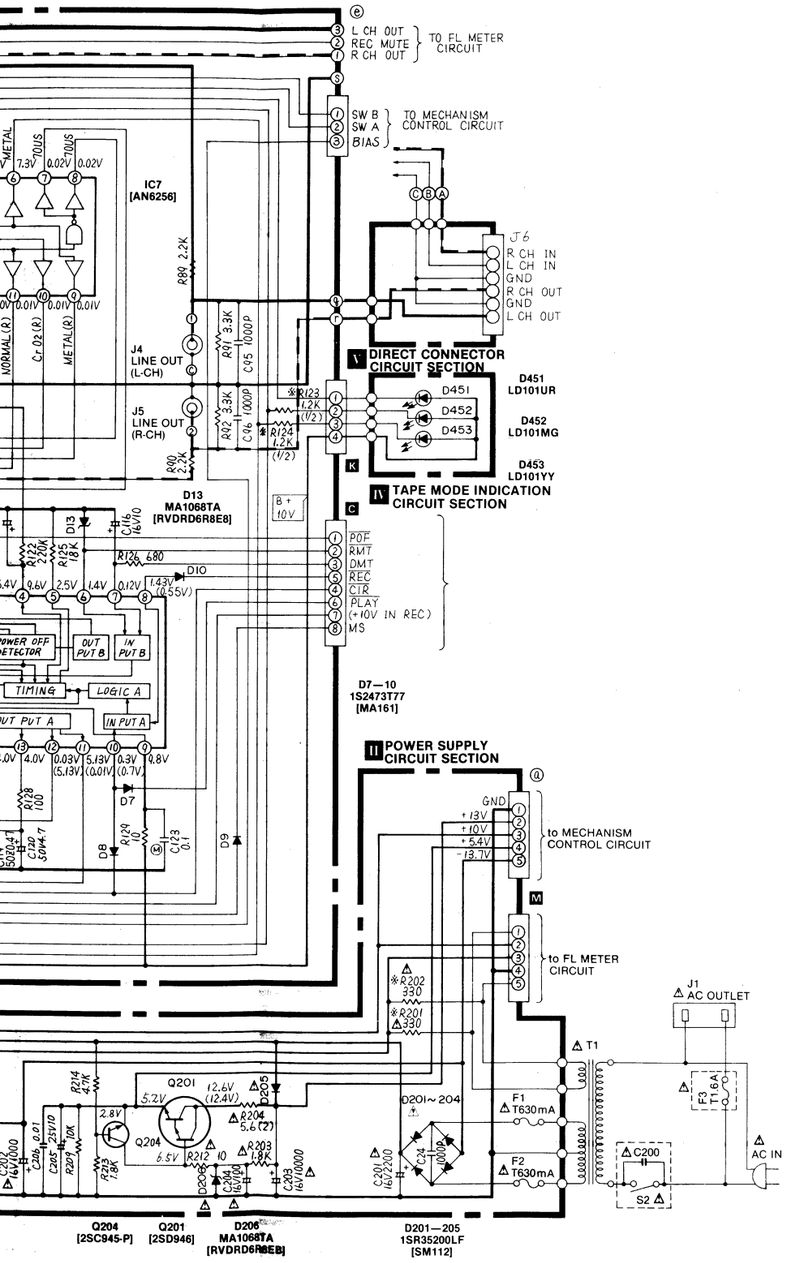
Q203 2SA886 (-Q, -R) [2SA886-Q]

D208 [MA1110]

Q204 [2SC945-P]

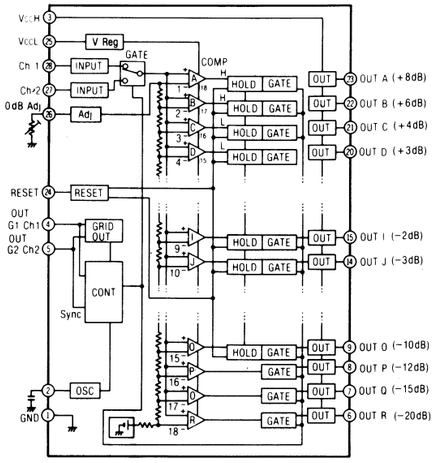
Q201 [2SD946]

D205 MA1068TA [RVDRD6R8EB]




## EQUIVALENT CIRCUIT

### IC301 AN6870N




**NOTES:**

- S1-1—S1-4 .....Dolby NR IN/OUT switch (shown in OUT position).
- S2.....Power ON/OFF switch (shown in OFF position).
- VR1, 2 .....Input level control.
- VR3, 4 .....Playback gain adjustment VR.
- VR5, 6 .....Recording gain adjustment VR.
- VR7, 8 .....Bias current adjustment VR.
- VR301 .....FL meter adjustment VR (for −20dB indication).
- VR302 .....FL meter adjustment VR (for 0dB indication).
- Connection points (A), (A')...Playback frequency adjustment points.
- Connection points (B), (C)...Erase current adjustment points.
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. 1K = 1,000(Ω), 1M = 1000 k(Ω).
- Capacity are in micro-farads (μF) unless specified otherwise.
- The mark (▼) shows test point. e.g. ▼ = Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  - No mark .....Voltage values at OUT (NR select switch) mode.
  - ( ) .....Voltage values at record mode.
  - VH .....Voltage values at high voltage.
  - VL.....Voltage values at low voltage.
  - For measurement use VTVM.
- (—▶—) indicates the flow of the playback signal (NR out).
- (—▶—) indicates the flow of the recording signal (NR out).
- Described in the schematic diagram are two types of numbers; the supply parts numbers and production parts number for transistors and diodes. One type of number is used for supply parts number and production parts number when they are identical.
  - e.g. Q1
  - 2SC1844(E, F)◀—Production parts number
  - [2SC1844E]◀—Supply parts number
  - D212
  - 1S2473T77◀—Production parts number
  - [MA161]◀—Supply parts numbers
- The supply parts number is described alone in the replacement parts list.

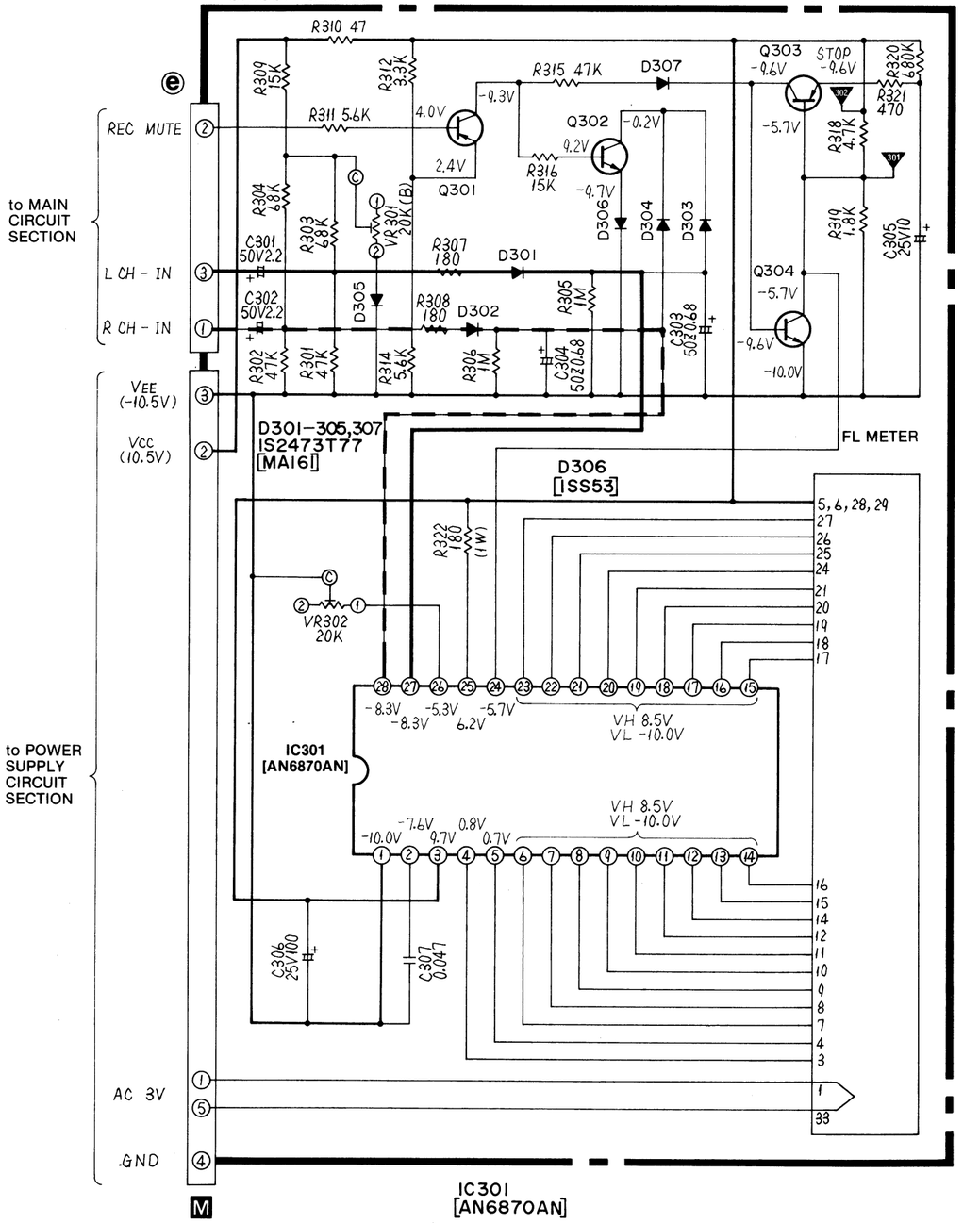
**• This schematic diagram may be modified at any time with the development of new technology.**

**SPECIFICATIONS** ＊Input level conntrols...MAX

| | |
|---|---|
| Playback S/N ratio<br>＊ Test tape...QZZCFM | Greater than 45dB |
| Overall distortion<br>＊ Test tape<br>...QZZCRA for Normal<br>...QZZCRX for $CrO_2$<br>...QZZCRZ for Metal | • Less than 3%: Normal<br>• Less than 3.5%: $CrO_2$/Metal |
| Overall S/N ratio<br>＊Test tape...QZZCRX | Greater than 45dB (without NAB filter) |



# SCHEMATIC DIAGRAM
## (for FL Meter Circuit Section)



# ELECTRICAL PARTS LIST

**NOTES:** RESISTORS
- ERD .....Carbon
- ERG .....Metal-oxide
- ERS.....Metal-oxide
- ERO .....Metal-film
- ERX.....Metal-film
- ERQ .....Fuse type metallic
- ERC .....Solid
- ERF.....Cement

CAPACITORS
- ECBA .....Ceramic
- ECG□.....Ceramic
- ECK□.....Ceramic
- ECC□.....Ceramic
- ECF□.....Ceramic
- ECQM.....Polyester film
- ECQE .....Polyester film
- ECQF .....Polypropylene
- ECE□ .....Electrolytic
- ECE□N ...Non polar electrolytic
- ECQS .....Polystyrene
- ECS□ .....Tantalum
- QCS .....Tantalum

## REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

### RESISTORS

| Ref No. | Part No. |
|---|---|
| R 1, 2 | ERD25TJ393 |
| R 3, 4 | ERD25TJ474 |
| R 5, 6 | ERD25FJ102 |
| R 7, 8 | ERD25FJ822 |
| R 9, 10 | ERD25FJ100 |
| R 11, 12 | ERD25TJ104 |
| R 13, 14 | ERD25FJ151 |
| R 15, 16 | ERD25FJ332 |
| R 17, 18 | ERD25FJ472 |
| R 19, 20 | ERD25TJ224 |
| R 21, 22 | ERD25TJ153 |
| R 23, 24, 25, 26 | ERD25FJ102 |
| R 27, 28 | ERD25FJ562 |
| R 29, 30 | ERD25TJ224 |
| R 31, 32 | ERD25TJ123 |
| R 33, 34 | ERD25TJ183 |
| R 35, 36 | ERD25FJ181 |
| R 37 | ERD25FJ103 |
| R 38 | ERD25FJ102 |
| R 39 | ERD25FJ471 |
| R 40 | ERD25TJ123 |
| R 41, 42 | ERD25FJ822 |
| R 43 | ERD25FJ392 |
| R 44 | ERD25FJ471 |
| R 45 | ERD25TJ105 |
| R 48 | ERD25FJ472 |
| R 49, 50 | ERD50FJ820 |
| R 51, 52 | ERD25TJ473 |
| R 53, 54 | ERD25TJ684 |
| R 55, 56 | ERD25FJ332 |
| R 57, 58 | ERD25TJ274 |
| R 59, 60 | ERD25TJ184 |
| R 61, 62 | ERD25TJ274 |
| R 63, 64 | ERD25FJ332 |
| R 65, 66 | ERD25FJ392 |
| R 67, 68 | ERD25FJ272 |
| R 69, 70 | ERD25TJ105 |
| R 71, 72 | ERD25FJ181 |
| R 73, 74 | ERD25FJ680 |
| R 75, 76 | ERD25FJ681 |
| R 77, 78 | ERD25FJ122 |
| R 79, 80 | ERD25FJ272 |
| R 81, 82 | ERD25FJ392 |
| R 83, 84 | ERD25FJ103 |
| R 85, 86 | ERD25FJ562 |
| R 87, 88 | ERD2FCG270 |
| R 89, 90 | ERD25FJ222 |
| R 91, 92 | ERD25FJ332 |
| R 93 | ERD25FJ1R0 |
| R 94 | ERD25FJ562 |
| R 95 | ERD25FJ100 |
| R 96 | ERD25FJ562 |
| R 97 | ERD25FJ100 |
| R 98, 99 | ERD25FJ681 |
| R 100, 101 | ERD25FJ101 |
| R 102, 103 | ERD25TJ473 |
| R 104 | ERD25FJ103 |
| R 105 | ERD25TJ223 |
| R 106 | ERD25FJ562 |
| R 107 | ERG1ANJ560 |
| R 109, 110 | ERD25TJ473 |
| R 111 | ERD25TJ333 |
| R 112 | ERD25TJ104 |
| R 113 | ERD25TJ154 |
| R 114 | ERD25FJ332 |
| R 115 | ERD25FJ103 |
| R 116 | ERD25FJ332 |
| R 117, 118 | ERD25FJ103 |
| R 119 | ERD25FJ272 |
| R 122 | ERD25TJ224 |
| R 123, 124 | ERDS1TJ122 |
| R 125 | ERD25TJ183 |
| R 126 | ERD25FJ681 |
| R 127 | ERD25FJ102 |
| R 128 | ERD25FJ101 |
| R 129 | ERD2FCG100 |
| R 130 | ERD25TJ223 |
| R 131 | ERD25FJ472 |
| R 132 | ERD25FJ561 |
| R 133, 134 | ERD25FJ103 |
| R 135, 136 | ERD25FJ822 |
| R 137, 138 | ERD25FJ682 |
| R 139, 140 | ERD25FJ102 |
| R 141, 142 | ERD25TJ153 |
| R 144 ⚠ | ERD25FJ103 |
| R 201, 202 ⚠ | ERD25FJ331 |
| R 203 ⚠ | ERD25FJ182 |
| R 204 ⚠ | ERX2ANJ5R6 |
| R 205 | ERD25FJ681 |
| R 206 ⚠ | ERD25FJ681 |
| R 207 | ERD25TJ223 |
| R 208 | ERD25TJ123 |
| R 209, 210, 211 | ERD25FJ103 |
| R 212 ⚠ | ERD25FCG100 |
| R 213 | ERD25FJ182 |
| R 214 | ERD25FJ472 |
| R 301, 302 | ERD25TJ473 |
| R 303, 304 | ERD25TJ683 |
| R 305, 306 | ERD25TJ105 |
| R 307, 308 | ERD25FJ181 |
| R 309 | ERD25TJ153 |
| R 310 | ERD2FCG470 |
| R 311 | ERD25FJ562 |
| R 312 | ERD25FJ332 |
| R 314 | ERD25FJ562 |
| R 315 | ERD25TJ473 |
| R 316 | ERD25TJ153 |
| R 318 | ERD25FJ472 |
| R 319 | ERD25FJ182 |
| R 320 | ERD25TJ684 |
| R 321 | ERD25FJ471 |
| R 322 | ERG1ANJ181 |
| R 401, 402, 403 | ERD25FJ392 |
| R 404 | ERD25TJ563 |
| R 405 | ERD25TJ333 |
| R 406 | ERD25TJ153 |
| R 407 | ERD25TJ223 |
| R 408 | ERD25TJ563 |
| R 409, 410, 411, 412 | ERD25FJ222 |
| R 413 ⚠ | ERD25FJ471 |
| R 414 | ERD25FJ562 |
| R 415 | EXBD86181K |
| R 418 | ERD25TJ273 |
| R 419 | ERD25FJ103 |
| R 420 | ERD25FJ1R0 |
| R 421 | ERD25FJ221 |
| R 422 | ERD25TJ223 |
| R 423 | ERD25FJ472 |
| R 424 | ERD25TJ223 |
| R 425 | ERD25TJ153 |
| R 426, 427 | ERD25FJ103 |
| R 428 | ERD25FJ562 |
| R 429 | ERD25FJ101 |
| R 430, 431, 432, 433 | ERD25FJ103 |
| R 435 | ERD25TJ223 |
| R 436 | ERD25FJ103 |
| R 437 | ERD25FJ681 |
| R 438 | ERD25FJ102 |
| R 501 | ERD25TJ473 |

### VARIABLE RESISTORS

| | |
|---|---|
| VR 1, 2 | QVAG1AU10A24 |
| VR 3, 4 | QVNB3A00B331 |
| VR 5, 6 | QVNB3A00B104 |
| VR 7, 8 | QVNB3A00B224 |
| VR 301, 302 | QVNB3A00B223 |

### CAPACITORS

| | |
|---|---|
| C 1, 2 | ECEA1HS100 |
| C 3, 4 | ECEA50Z1 |
| C 5, 6 | ECEA1HS100 |
| C 7, 8 | ECKD1H221KB |
| C 9, 10 | ECKD1H391KB |
| C 11, 12 | ECQV05223JZ |
| C 13, 14, 15, 16 | ECEA50Z1 |
| C 17, 18 | ECQV05153JZ |
| C 19, 20 | ECKD1H102KB |
| C 21, 22 | ECEA1AS221 |
| C 23, 24 | ECQV05334JZ |
| C 25, 26 | ECQV05123JZ |
| C 27, 28 | ECEA1CU471 |
| C 29 | ECEA50Z1 |
| C 30 | ECQM1H392JZ |
| C 31 | ECEA50Z1 |
| C 32, 33 | ECQV05103JZ |
| C 34 | ECQV05223JZ |
| C 35 | ECEA50Z1 |
| C 37, 38 | ECEA1AS221 |
| C 39, 40 | ECQV0273JZ |
| C 41, 42 | ECQM1H472JZ |
| C 43, 44 | ECEA1HS100 |
| C 45, 46 | ECEA50ZR33 |
| C 47, 48 | ECQV05104JZ |
| C 49, 50 | ECQM1H392JZ |
| C 51, 52 | ECCD1H470J |
| C 53, 54, 55, 56 | ECEA1HS100 |
| C 57, 58 | ECQV05473JZ |
| C 59, 60 | ECKD1H102KB |
| C 61, 62 | ECQV05224JZ |
| C 63, 64 | ECEA50Z1 |
| C 65, 66 | ECQM1H562JZ |
| C 67, 68 | ECQV05154JZ |
| C 69, 70 | ECEA50Z1 |
| C 71, 72 | ECEA1CN100S |
| C 73, 74 | ECEA1ES220 |
| C 75, 76 | ECKD1H221KB |
| C 77, 78 | ECQV05223JZ |
| C 79, 80 | ECQV05683JZ |
| C 81, 82 | ECQV05273JZ |
| C 83, 84 | ECQV05223JZ |
| C 85, 86 | ECEA50ZR68 |
| C 87, 88 | ECKD1H152KB |
| C 89, 90 | ECQM1H822JZ |
| C 91, 92 | ECEA1AS221 |
| C 93, 94 | ECCD1H101J |
| C 95, 96 | ECKD1H102KB |
| C 97, 98 | ECKD1H151KB |
| C 99 | ECQP1153JZ |
| C 100 | ECQV05153JZ |
| C 102 | ECQM1H822JZ |
| C 103 | ECEA50Z1 |
| C 104 | ECEA1ES470 |
| C 106 | ECEA50ZR68 |
| C 107 | ECEA50Z1 |
| C 108 | ECQM1H392JZ |
| C 109 | ECEA50ZR22 |
| C 110, 111 | ECEA50Z4R7 |
| C 112 | ECEA1CS330 |
| C 115, 116 | ECEA1HS100 |
| C 117 | ECQV05104JZ |
| C 118 | ECEA1AS101 |
| C 119, 120 | ECEA50ZR47 |
| C 121 | ECKD1H103KB |
| C 122 | ECEA1AS470 |
| C 123 | ECQV05104JZ |
| C 125, 126 | ECKD1H151KB |
| C 127, 128 | ECQM1H272JZ |
| C 129 | ECQV0547JZ |
| C 130 | ECCD1H470J |
| C 131 | ECKD1H102KB |
| C 200 ⚠ | ECQU2A103MF |
| C 201 ⚠ | ECEA1CS222 |
| C 202 ⚠ | ECEA1CS102 |
| C 203 ⚠ | ECEA1CU103 |
| C 204 ⚠ | ECEA1ES101 |
| C 205 | ECEA1HS100 |
| C 206 | ECKD1H103MD |
| C 207 | ECEA1CS221 |
| C 208 ⚠ | ECEA1CS331 |
| C 209, 210 | ECKD1H103MD |
| C 211 | ECEA50Z3R3 |
| C 212, 213 | ECEA1CS331 |
| C 214 | ECKD1H102MD |
| C 301, 302 | ECEA50Z2R2 |
| C 303, 304 | ECEA50ZR68 |
| C 305 | ECEA1HS100 |
| C 306 | ECEA1ES101 |
| C 307 | ECQV05473JZ |
| C 401 | ECEA50Z2R2 |
| C 402 | ECEA1AS470 |
| C 403 | ECQM1H333KZ |
| C 404 | ECCD1H331J |
| C 405 | ECKD1H102MD |
| C 406 | ECEA50ZR1 |
| C 407 | EXRP4331MW |
| C 408 | EXFP4472ZW |
| C 409 | ECKD1H102MD |
| C 410 | ECEA1CS330 |
| C 411 | ECEA1ES220 |
| C 412 | ECEA50Z1 |
| C 413 | ECEA25Z4R7 |
| C 414 | ECEA1ES220 |
| C 415 | ECKD1H102MD |
| C 501 | ECEA1CN100 |

### TRANSISTORS

| | |
|---|---|
| Q 1, 2 | 2SD636 |
| Q 3, 4 | 2SK381 |
| Q 6, 7, 8 | 2SD1011 |
| Q 9, 10 | 2SD965 |
| Q 11 | 2SA921 |
| Q 12 | 2SC945-Q |
| Q 13 | 2SD592 |
| Q 14, 15 | 2SA1115D |
| Q 16 | 2SC945-Q |
| Q 17 | 2SA1115D |
| Q 18 | 2SC945-Q |
| Q 201 | 2SD946 |
| Q 202 | 2SC1847 |
| Q 203 | 2SA886-Q |
| Q 204 | 2SC945-Q |
| Q 301 | 2SA1115D |
| Q 302 | 2SC945-Q |
| Q 303 | 2SB641 |
| Q 304 | 2SC945-Q |
| Q 401, 402, 403, 404 | 2SC945-Q |
| Q 405 | 2SD636 |
| Q 406, 407, 408 | 2SC945-Q |
| Q 409 | 2SA1115D |

### DIODES & RECTIFIERS

| | |
|---|---|
| D 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 | MA161 |
| D 13 | RVDRD6R8EB |
| D 201, 202, 203 ⚠ | SM112 |
| D 204, 205 ⚠ | SM112 |
| D 206 ⚠ | RVDRD6R8EB |
| D 207 | MA1110 |
| D 208 ⚠ | MA1110 |
| D 301, 302, 303, 304, 305 | MA161 |
| D 306 | 1SS53 |
| D 307, 401, 402, 403, 404 | MA161 |
| D 405 | RVDR6R8EB |
| D 406 | MA161 |
| D 407, 408, 409, 410, 411, 412 | MA161 |
| D 413 | SLR54YC |
| D 414 | SLR54GC |
| D 415 | SLR54URC |
| D 416 | MA161 |
| D 451 | LD101UR |
| D 452 | LD101MG |
| D 453 | LD101YY |
| D 501, 502, 503, 504 | MA161 |

### INTEGRATED CIRCUITS

| | |
|---|---|
| IC 1, 2 | AN6212 |
| IC 3, 4 | NE646N |
| IC 5, 6 | AN6213 |
| IC 7 | AN6256 |
| IC 8 | AN6214 |
| IC 9 | BA336M |
| IC 301 | AN6870N |
| IC 401 | MN14001RMA |
| IC 402 | AN6270 |
| IC 501 | DN6838 |

### IC PROTECTOR

| | |
|---|---|
| ICP 501 | QRUF10WH |

| Ref No. | Part No. | Part Name & Description |
|---|---|---|

### MULTIPLEX FILTERS

| | | |
|---|---|---|
| MPX 1, 2 | QLM9Z9K | Coil |

### COILS

| | | |
|---|---|---|
| L 1, 2 | QLQX0332KWA | Peaking Coil |
| L 3, 4 | QLQX0343KWA | Bias Trap Coil |
| L 5 | QLQX0332KWA | Peaking Coil |
| L 6 | QLB0198 | Bias Oscillattion Coil |
| L 401 | ELEH101KA | Choke Coil |
| L 501, 502 | QLQZ1014D | Choke Coil |

### TRANSFORMER

| | | |
|---|---|---|
| T 1 | ⚠ QLPD73ELE | AC Power Transfomer |

### FUSES

| | | |
|---|---|---|
| F 1, 2 | ⚠ XBAQ0008 | Fuse (T 630mA) |
| F 3 | ⚠ XBAQ0010 | Fuse (T 1.6A) |

### SWITCHES

| | | |
|---|---|---|
| S 1 | QSW4214 | Push Switch (Dolby IN/OUT) |
| S 2 | ⚠ QSW1117AS | Switch (for Power ON/OFF) |
| S 401, 402, 403, 404, 405, 406, 407 | QSW1128 | Key Board Switch (REC Mute/Stop/Play/F.F/REW/REC/Pause) |
| S 408 | QSW2237 | Push Switch (Music Selector) |
| S 409 | QSS1304 | Slide Switch (Timer SW) |
| S 501 | QSB0289 | Leaf Switch (REC Inhibit) |
| S 502 | QSB0287 | Leaf Switch (Mode) |
| S 503 | QSB0288 | Leaf Switch (Stop) |
| S 504 | QSB0287 | Leaf Switch (Play) |
| S 505 | QSB0288 | Leaf Switch (Eject) |
| S 506 | QSB0290 | Leaf Switch (for $CrO_2$) |
| S 507 | QSB0289 | Leaf Switch (for Metal Tape) |

### JACKS

| | | |
|---|---|---|
| J 1 | QJA0258 | MIC Jack |
| J 2, 3, 4, 5 | SJF3053 | Jack Board (LINE IN/OUT) |
| J 6 | SJS9607 | Direct Connector |
| J 7 | ⚠ SJS9225 | AC Outlet Socket |
| J 8 | QJA0172 | Jack (Synchro REC) |

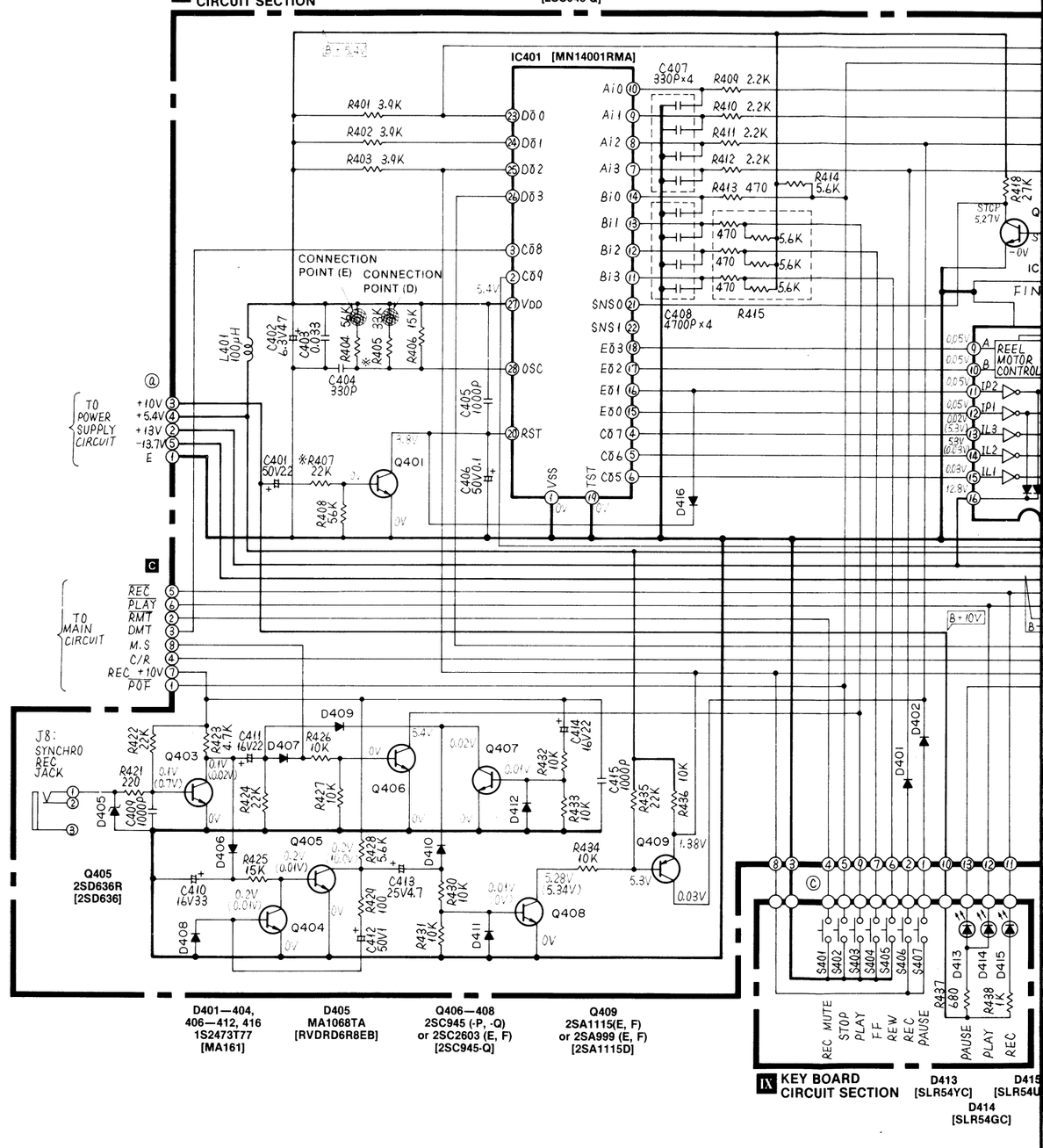
### CONNECTORS

| | | |
|---|---|---|
| CN 1 | QJT1054 | Contact |
| CN 2 | QJS1921TN | 3 Pin Socket |
| CN 3 | QJP1921TN | 3 Pin Post |
| CN 4 | QJS1922TN | 6 Pin Socket |
| CN 5 | QJP1922TN | 6 Pin Post |
| CN 6 | QJT1089 | Contact |
| CN 7 | QJS04001T | 4 Pin Socket |
| CN 8 | QJP04S001T | 4 Pin Post (L-Type) |
| CN 9 | QJS1997S | Jumper Socket (3 Pin) |
| CN 10 | QJS1987S | Jumper Socket (4 pin) |
| CN 11 | QJS1961S | Jumper Socket (5 Pin) |
| CN 12 | QJS1983S | Jumper Socket (8 Pin) |
| CN 13 | QJS1989S | Jumper Socket (10 Pin) |
| CN 14 | QJS1996S | Jumper Socket (14 Pin) |

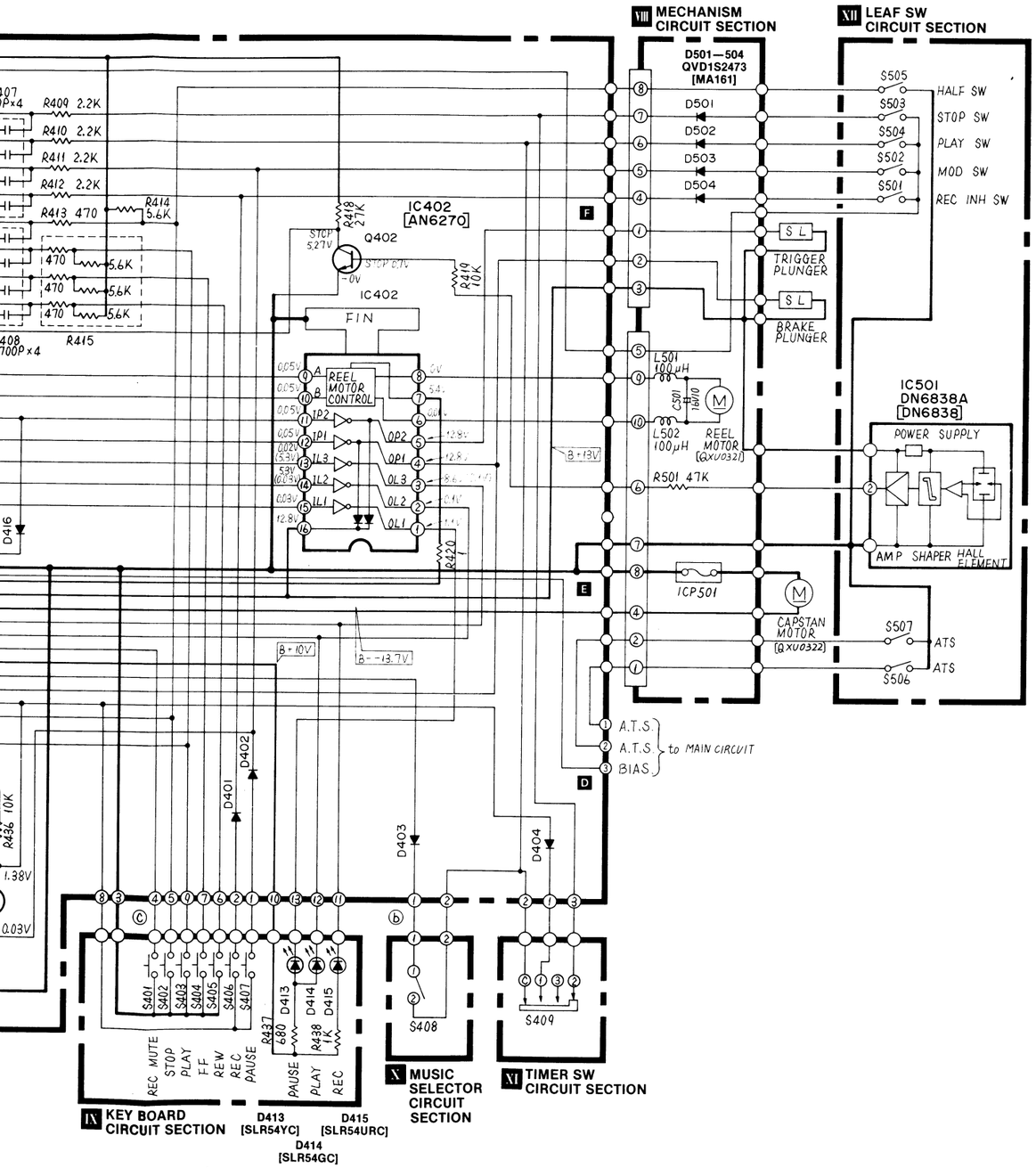


# SCHEMATIC DIAGRAM

## (for Mechanism/Mechanism Control/Leaf SW Circuit Section)



## Section)



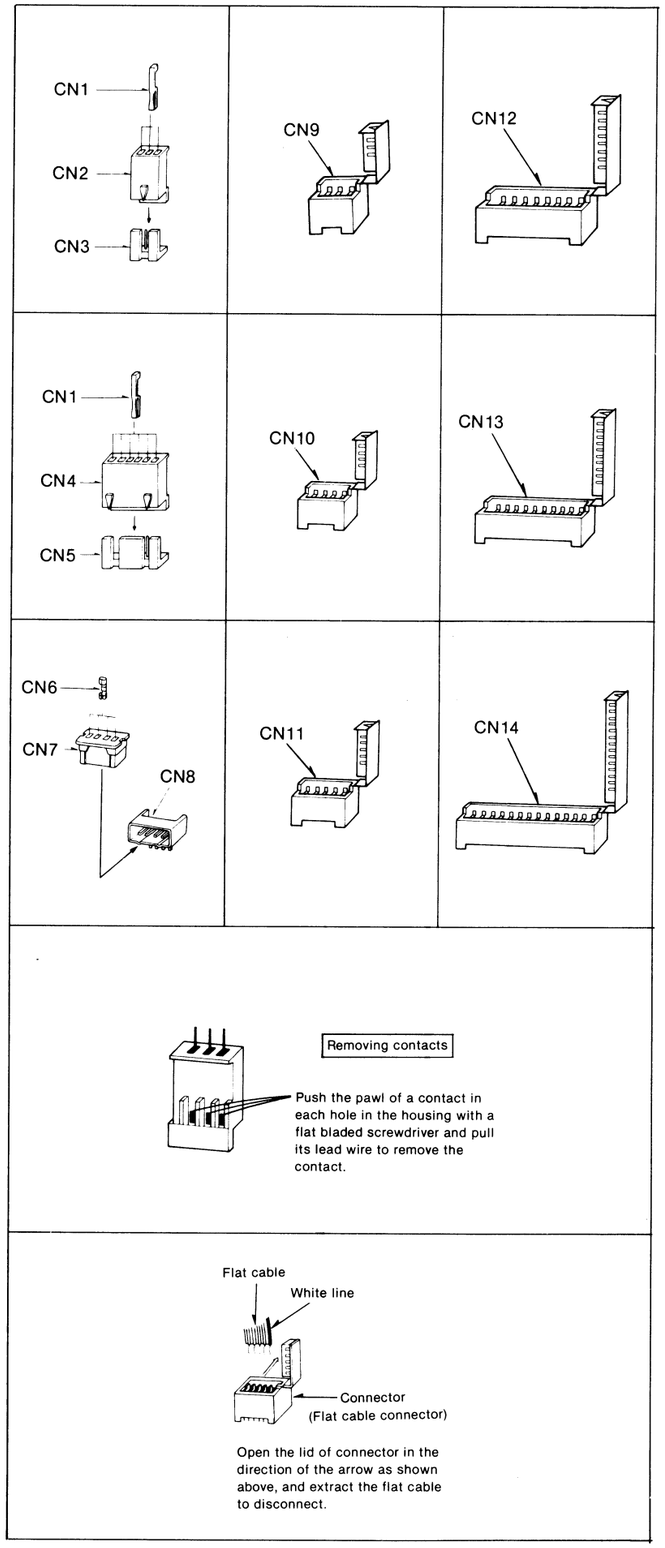

**NOTES:**

- S401 .....REC mute switch (shown in OFF position).
- S402 .....Stop switch (shown in OFF position).
- S403 .....Play switch (shown in OFF position).
- S404 .....FF switch (shown in OFF position).
- S405 .....Rewind switch (shown in OFF position).
- S406 .....Record switch (shown in OFF position).
- S407 .....Pause switch (shown in OFF position).
- S408 .....Music select switch (shown in OFF position).
- S409 .....Timer switch (shown in (1) position).
  ((1)...T. REC, (2)...OFF, (3)...T. PLAY).
- S501 .....REC inhibit switch (shown in OFF position).
- S502 .....Mode switch (shown in OFF position).
- S503 .....Stop switch (shown in OFF position).
- S504 .....Play switch (shown in OFF position).
- S505 .....Half switch (shown in OFF position).
- S506 .....Auto tape select switch (for Metal tape).
- S507 .....Auto tape select switch (for $CrO_2$ tape).
- Connection points (D), (E)...Input scanning time adjustment points.
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  1K = 1,000(Ω), 1M = 1,000k(Ω).
- Capacity are in micro-farads (μF) unless specified otherwise.
- The mark (▼) shows test point. e.g. ▼ = Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  No mark .....Voltage values at OUT (NR select switch) mode.
  ( ) .....Voltage values at record mode.
  For measurement use VTVM.
- Described in the schematic diagram are two types of numbers; the supply parts numbers and production parts number for transistors and diodes. One type of number is used for supply parts number and production parts number when they are identical.
  e.g. Q1
  2SC1844(E, F)◄—Production parts number
  [2SC1844E]◄—Supply parts number
  D212
  1S2473T77◄—Production parts number
  [MA161]◄—Supply parts numbers
- The supply parts number is described alone in the replacement parts list.

**• This schematic diagram may be modified at any time with the development of new technology.**



## CONNECTORS





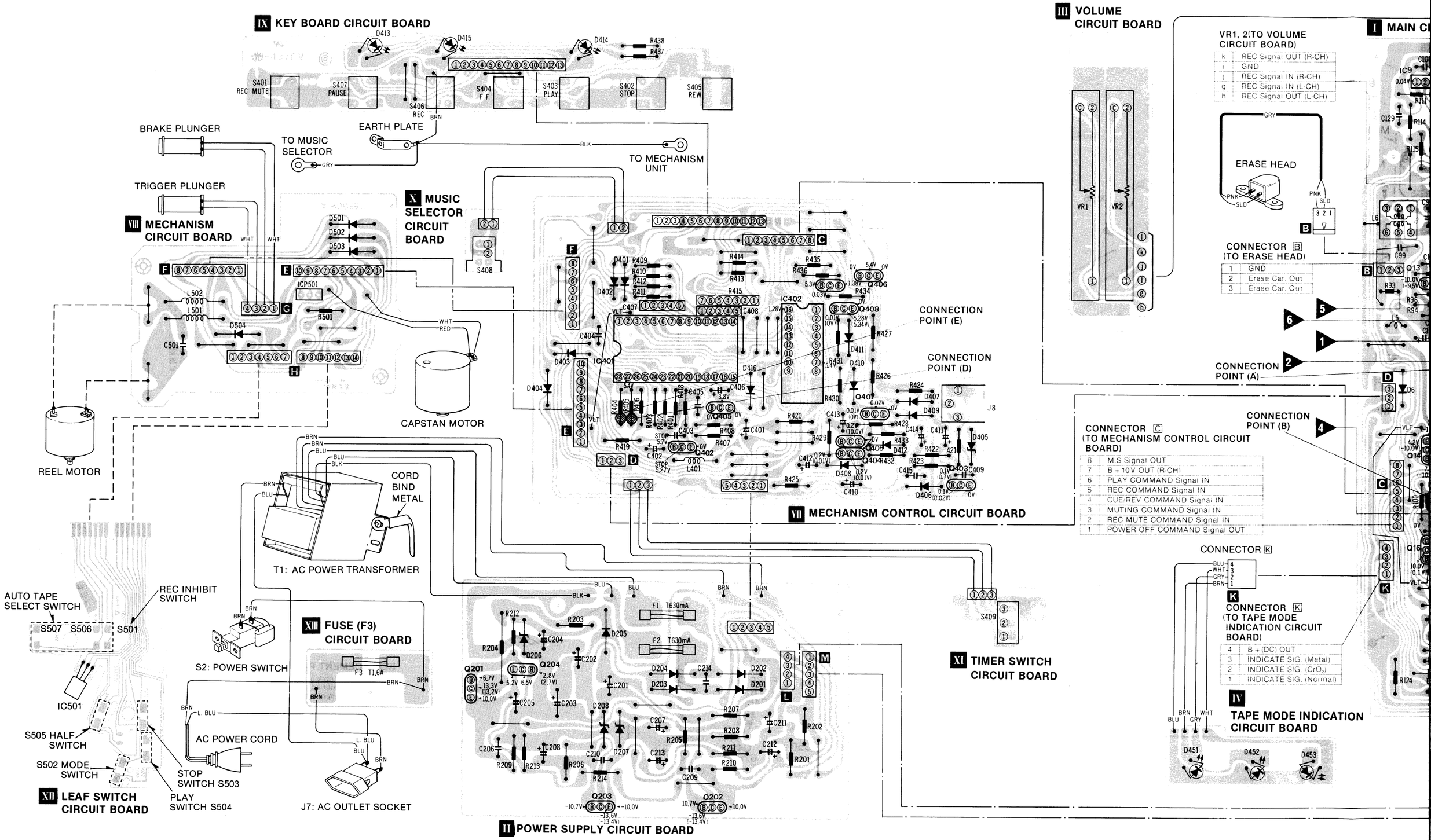

Removing contacts

Push the pawl of a contact in each hole in the housing with a flat bladed screwdriver and pull its lead wire to remove the contact.

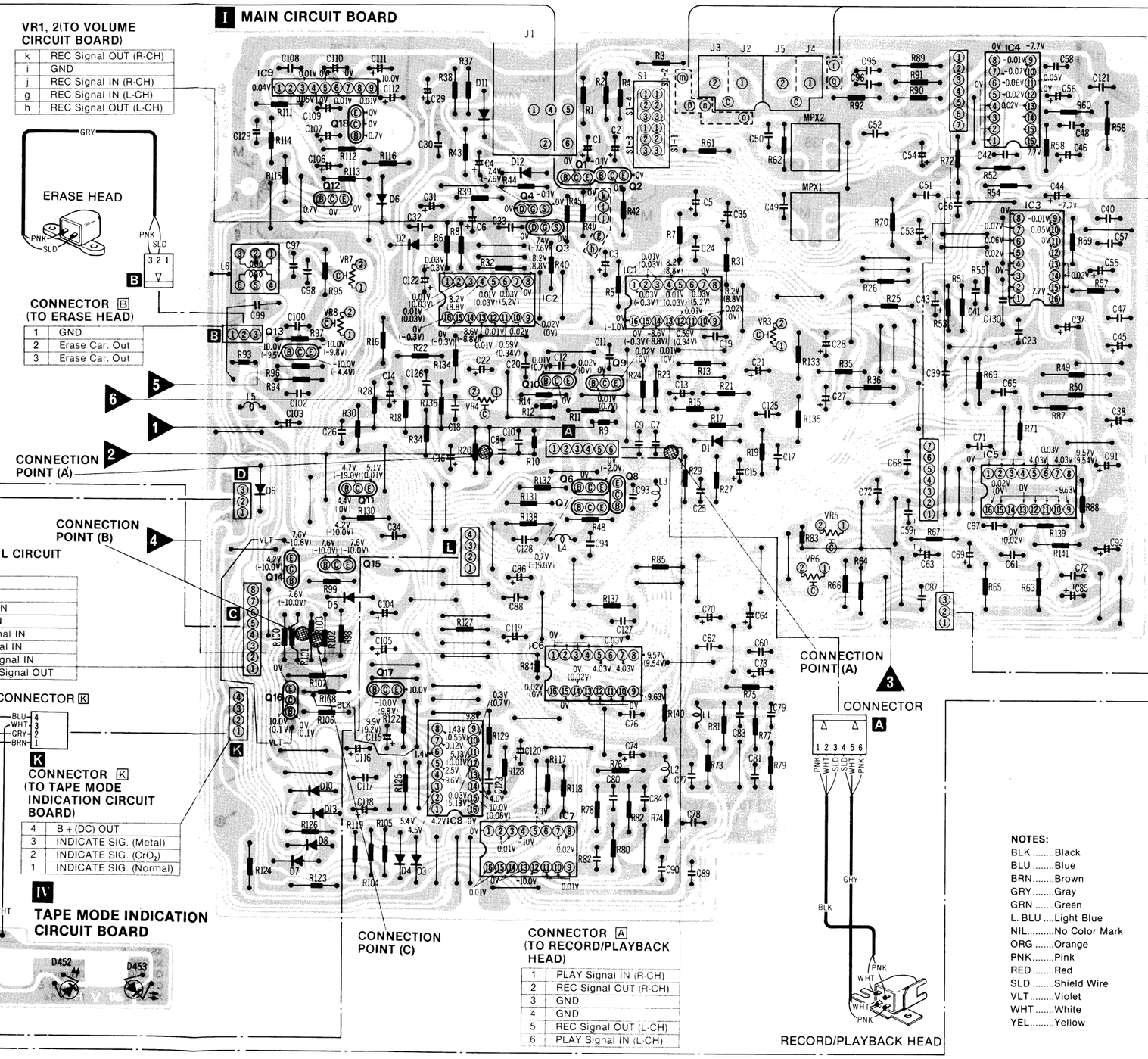



Open the lid of connector in the direction of the arrow as shown above, and extract the flat cable to disconnect.

# CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM



## I MAIN CIRCUIT BOARD




**NOTES:**

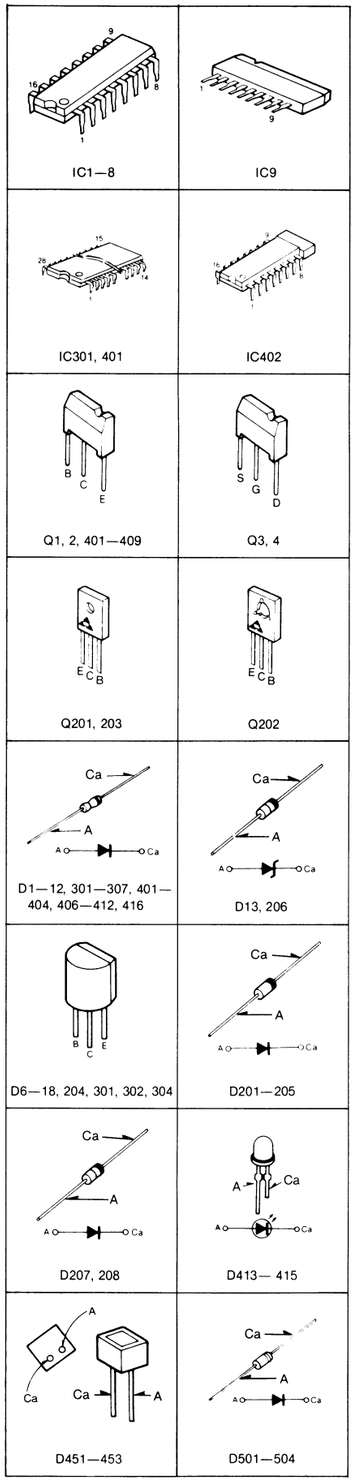
BLK .....Black
BLU .....Blue
BRN.....Brown
GRY.....Gray
GRN .....Green
L. BLU ....Light Blue
NIL.....No Color Mark
ORG .....Orange
PNK.....Pink
RED.....Red
SLD .....Shield Wire
VLT.....Violet
WHT.....White
YEL.....Yellow

**NOTES:**

- The circuit shown in ▨ on the conductor side indicates printed circuit to the back side of the printed circuit board.
- All voltage values shown in circuit board are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  No mark .....Voltage values at OUT (NR select switch) mode.
  ( ) .....Voltage values at record mode.
  VH .....Voltage values at high voltage.
  VL.....Voltage values at low voltage.
  For measurement use VTVM.

- **This circuit board may be modified at any time with the development of new technology.**

## TERMINATIONS



9 8 7 6 5 4 3 2 1

A B C D E F

## I MAIN CIRCUIT BOARD

VR1, 2(TO VOLUME CIRCUIT BOARD)

| | |
|---|---|
| k | REC Signal OUT (R-CH) |
| i | GND |
| j | REC Signal IN (R-CH) |
| g | REC Signal IN (L-CH) |
| h | REC Signal OUT (L-CH) |

ERASE HEAD

GRY, PNK, SLD

CONNECTOR B (TO ERASE HEAD)

| | |
|---|---|
| 1 | GND |
| 2 | Erase Car. Out |
| 3 | Erase Car. Out |

CONNECTION POINT (A)

CONNECTION POINT (B)

L CIRCUIT

| | |
|---|---|
| N | |
| | |
| nal IN | |
| al IN | |
| gnal IN | |
| Signal OUT | |

CONNECTOR K

BLU, WHT, GRY, BRN

K

CONNECTOR K (TO TAPE MODE INDICATION CIRCUIT BOARD)

| | |
|---|---|
| 4 | B + (DC) OUT |
| 3 | INDICATE SIG. (Metal) |
| 2 | INDICATE SIG. ($CrO_2$) |
| 1 | INDICATE SIG. (Normal) |

## IV TAPE MODE INDICATION CIRCUIT BOARD

D452, D453

CONNECTION POINT (C)

CONNECTOR A (TO RECORD/PLAYBACK HEAD)

| | |
|---|---|
| 1 | PLAY Signal IN (R-CH) |
| 2 | REC Signal OUT (R-CH) |
| 3 | GND |
| 4 | GND |
| 5 | REC Signal OUT (L-CH) |
| 6 | PLAY Signal IN (L-CH) |

CONNECTION POINT (A)

CONNECTOR A

PNK, WHT, SLD, GRY, BLK

RECORD/PLAYBACK HEAD

(TO DIRECT CONNECTOR)

| | |
|---|---|
| m | LINE IN (L-CH) |
| n | LINE IN (R-CH) |
| o | GND |
| p | GND |
| q | LINE OUT (L-CH) |
| r | LINE OUT (R-CH) |

(TO FL METER CIRCUIT BOARD)

| | |
|---|---|
| 1 | Signal OUT (R-CH) |
| 2 | REC MUTE COMMAND SIG. OUT |
| 3 | Signal OUT (L-CH) |

## V DIRECT CONNECTOR CIRCUIT BOARD

## VI FL METER CIRCUIT BOARD

**NOTES:**

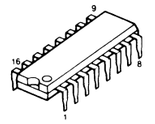
BLK .....Black
BLU .....Blue
BRN.....Brown
GRY.....Gray
GRN .....Green
L. BLU ....Light Blue
NIL.....No Color Mark
ORG .....Orange
PNK.....Pink
RED.....Red
SLD .....Shield Wire
VLT.....Violet
WHT.....White
YEL.....Yellow

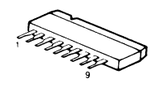
**NOTES:**

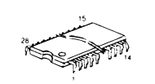
- The circuit shown in [ ] on the conductor side indicates printed circuit to the back side of the printed circuit board.
- All voltage values shown in circuit board are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  No mark .....Voltage values at OUT (NR select switch) mode.
  ( ) .....Voltage values at record mode.
  VH .....Voltage values at high voltage.
  VL.....Voltage values at low voltage.
  For measurement use VTVM.

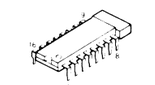
- **This circuit board may be modified at any time with the development of new technology.**

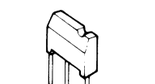
## TERMINATIONS


IC1—8

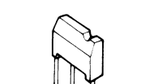

IC9


IC301, 401

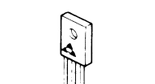

IC402



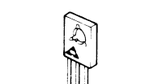
Q1, 2, 401—409



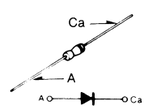
Q3, 4



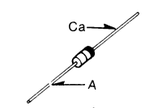
Q201, 203



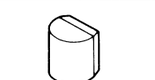
Q202



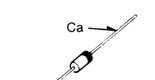
D1—12, 301—307, 401—404, 406—412, 416



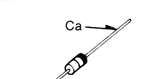
D13, 206



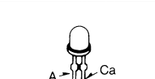
D6—18, 204, 301, 302, 304



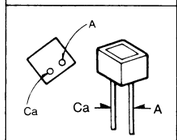
D201—205



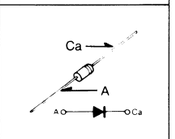
D207, 208



D413— 415



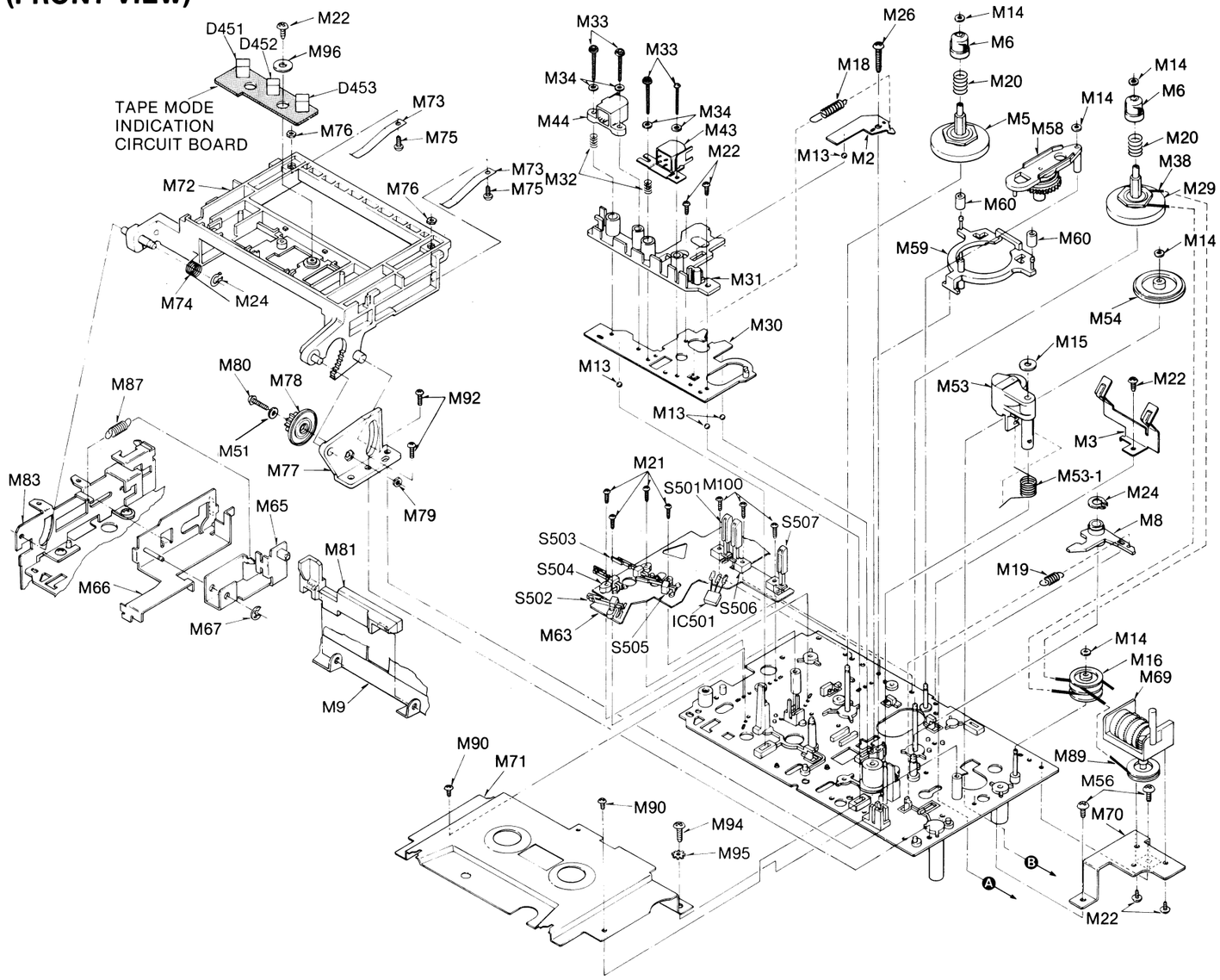
D451—453



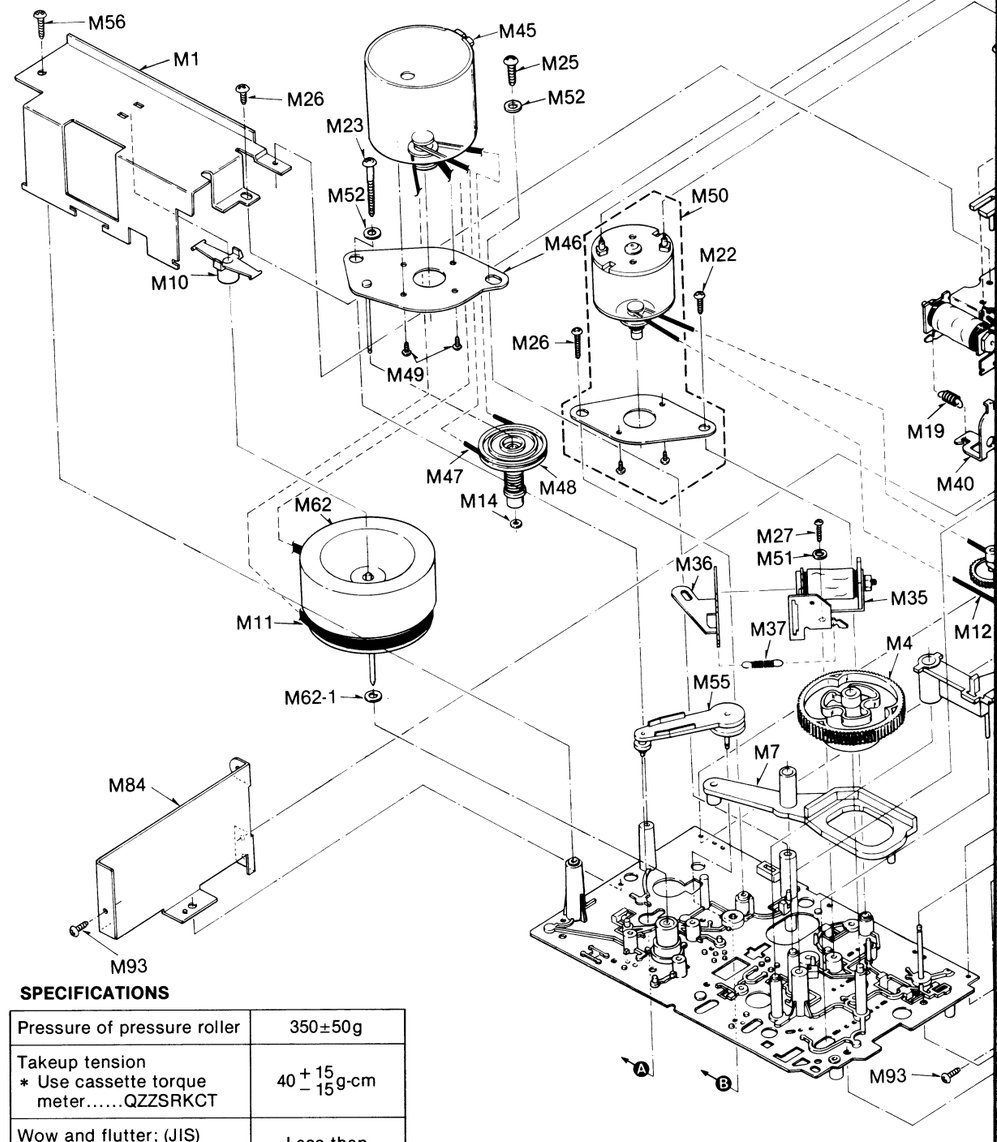
D501—504

# MECHANICAL PARTS LOCATION

## (FRONT VIEW)




## (REAR VIEW)

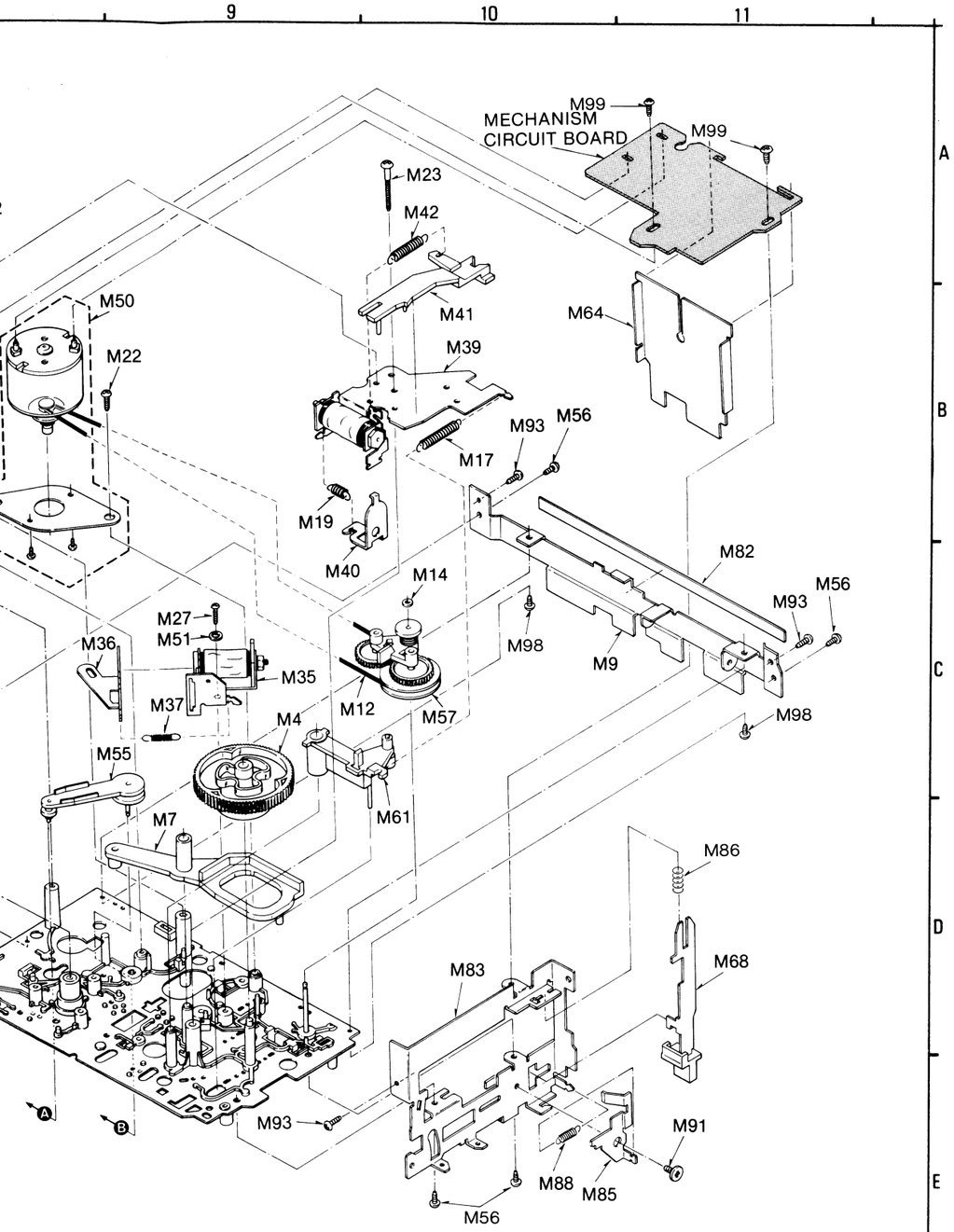



### SPECIFICATIONS

| | |
|---|---|
| Pressure of pressure roller | 350±50g |
| Takeup tension<br>* Use cassette torque meter.....QZZSRKCT | $40^{+15}_{-15}$ g-cm |
| Wow and flutter; (JIS)<br>* Use test tape .....QZZCWAT | Less than 0.08% (WRMS) |

### REPLACEMENT PARTS LIST

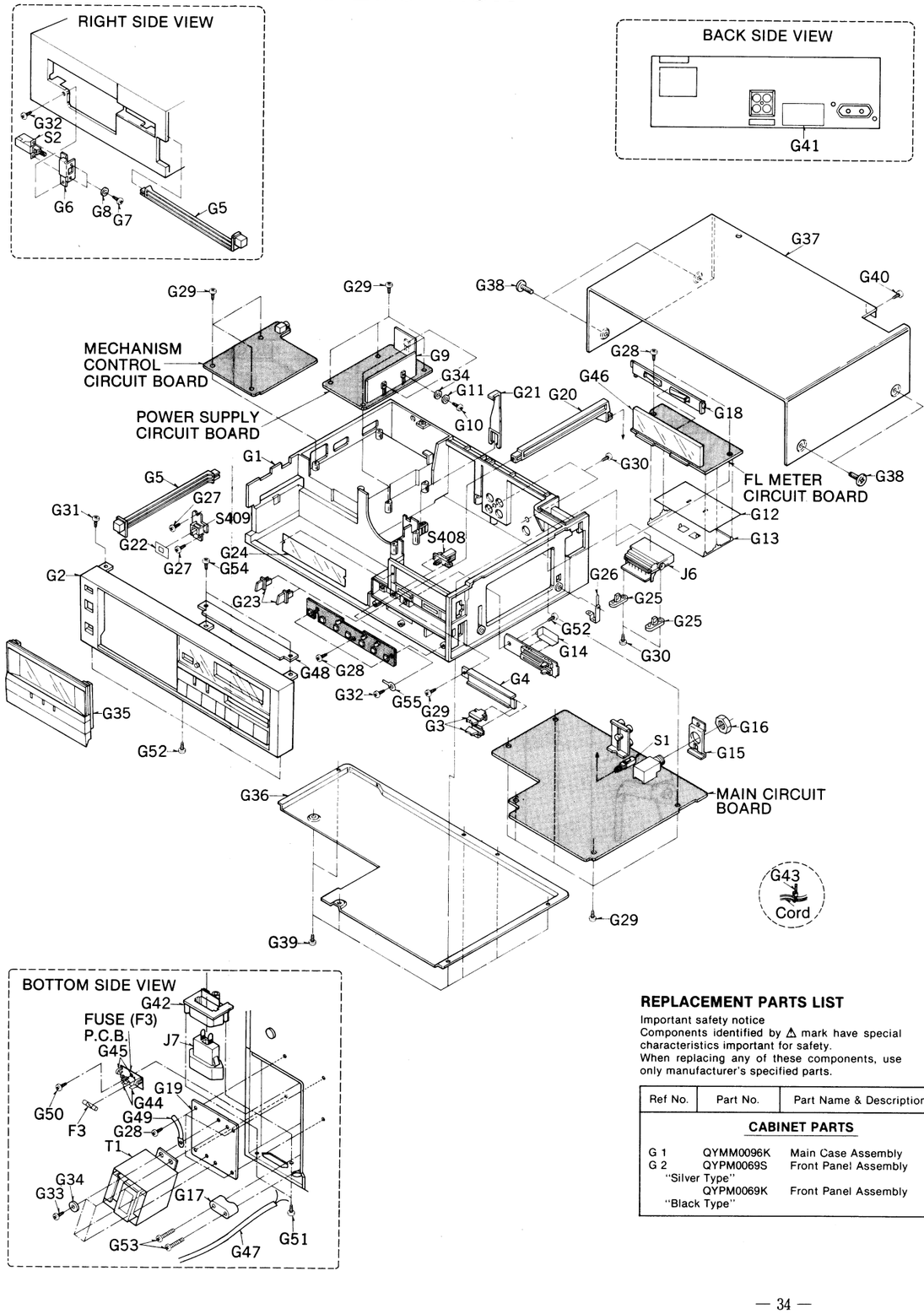
| Ref No. | Part No. | Part Name & Description |
|---|---|---|
| | | **MECHANIAL PARTS** |
| M 1 | QMA4534 | Flywheel Retainer |
| M 2 | QBP1894 | Head Base Plate Spring |
| M 3 | QBP1979 | Cassette Pressure Spring |
| M 4 | QXG1059 | Main Gear Assembly |
| M 5 | QXD0147 | Supply Reel Table |
| M 6 | QMB1336 | Reel Table Hub |
| M 7 | QML3655 | Cam Follower |
| M 8 | QML3660 | Idler Select Lever |
| M 9 | QMA4544 | Mechanism Upper Angle |
| M 10 | QMZ1293 | Flywheel Thrust Retainer |
| M 11 | QDB0333 | Flywheel Belt |
| M 12 | QDB0287 | Changing Belt |
| M 13 | QDK1012 | Steel Ball 2.5φ |
| M 14 | QBW2008 | Snap Washer |
| M 15 | QBW2046 | Snap Washer |
| M 16 | QDP1946 | Intermediate Pulley |
| M 17 | QBT1725 | Lock Lever Spring |
| M 18 | QBT1927 | Head Base Plate Spring |
| M 19 | QBT1920 | Idler Spring |
| M 20 | QBC1373 | Reel Table Spring |
| M 21 | XTN2+5B | Tapping Screw ⊕2×5 |
| M 22 | XTN26+6B | Tapping Screw ⊕2.6×6 |
| M 23 | XTN3+24B | Tapping Screw ⊕3×24 |
| M 24 | XUB4FT | Stop Ring 4φ |
| M 25 | XTN3+10B | Tapping Screw ⊕3×10 |
| M 26 | XTN26+12B | Tapping Screw ⊕2.6×12 |
| M 27 | XTN26+8B | Tapping Screw ⊕2.6×8 |
| M 29 | QDR1164 | Takeup Reel Table |
| M 30 | QMK1867 | Head Base Plate |
| M 31 | QMZ1263 | Spacer |
| M 32 | QBC1103 | Spring |
| M 33 | XSN2+16 | Screw ⊕2×16 |
| M 34 | XWG2 | Washer 2φ |
| M 35 | QXA1232 | Brake Plunger Assembly |
| M 36 | QML3865 | Plunger Lever |
| M 37 | QBT1955 | Plunger Spring |
| M 38 | QDB0167 | Counter Belt-A |
| M 39 | QXA1076 | Trigger Plunger Assembly |
| M 40 | QML3651 | Trigger Plunger Lever |
| M 41 | QML3653 | Control Lever |
| M 42 | QBT1278 | Record Lock Lever Spring |
| M 43 | QWY4122Z | Record/Playback Head |
| M 44 | QWY2138Z | Erase Head |
| M 45 | QXU0322 | Capstan Motor Assembly |
| M 46 | QXA1328 | Motor Retainer Assembly |
| M 47 | QDB0332 | Takeup Belt |
| M 48 | QXP0621 | Takeup Pulley Assembly |
| M 49 | XSN26+3 | Screw ⊕2.6×3 |
| M 50 | QXU0321 | Reel Motor Assembly |
| M 51 | XWG26 | Washer 2.6φ |
| M 52 | XWG3 | Washer 3φ |
| M 53 | QXL1550 | Pressure Roller Assembly |
| M 53-1 | QBN1771 | Pressure Roller Spring |
| M 54 | QXi0113 | Takeup Idler Assembly |
| M 55 | QXL1603 | Idler Lever Assembly |
| M 56 | XTN3+6B | Tapping Screw ⊕3×6 |
| M 57 | QXL1408 | Swing Gear Assembly |
| M 58 | QXL1604 | Fast Wind Gear Assembly |
| M 59 | QML3659 | Brake Lever |
| M 60 | QBG1132 | Brake Rubber |
| M 61 | QXL1411 | Lock Lever Assembly |
| M 62 | QXF0211 | Flywheel Assembly |
| M 62-1 | QBW2099 | Poly Washer |
| M 63 | QJi1776RR | Leaf Switch P.C.B. |
| M 64 | QTW1315 | Insulating Plate |
| M 65 | QXL1592 | Lock Lever-A Assembly |
| M 66 | QXL1593 | Lock Lever-B Assembly |
| M 67 | QXU25FT | Stop Ring 2.5φ |
| M 68 | QXR0864 | Eject Button Assembly |
| M 69 | QDC0157 | Counter |
| M 70 | QMA4547 | Counter Angle |
| M 71 | QXH0421 | Mechanism Cover Assembly |
| M 72 | QKFM6010K | Cassette Holder |
| M 73 | QBP1899 | Holder Spring |
| M 74 | QBN1960 | Eject Spring |
| M 75 | XSN2+5 | Screw ⊕2×5 |
| M 76 | XNG2E | Nut 2φ |
| M 77 | QMA4535 | Dumper Angle |
| M 78 | QDG1254 | Dumper Gear |
| M 79 | XNG26E | Nut 2.6φ |
| M 80 | XSN26+8 | Screw ⊕2.6×8 |
| M 81 | QML3972 | A.T.S. Lever |
| M 82 | QTWM0039 | Insulating Plate |
| M 83 | QMA4545 | Side Angle-L |
| M 84 | QMA4546 | Side Angle-R |
| M 85 | QML3973 | Obstruction Le |
| M 86 | QBC1244 | Stop Rod Spri |
| M 87 | QBT1580 | Stop Lever Sp |




| Name & Description | Ref No. | Part No. | Part Name & Description | Ref No. | Part No. | Part Name & Description |
|---|---|---|---|---|---|---|
| witch P.C.B. | M 75 | XSN2+5 | Screw ⊕2×5 | M 88 | QBT1947 | Head Reatainer Spring |
| ng Plate | M 76 | XNG2E | Nut 2φ | M 89 | QDB0334 | Counter Belt |
| ver-A Assembly | M 77 | QKJM0088 | Dumper Angle | | | |
| ver-B Assembly | M 78 | QDG1254 | Dumper Gear | M 90 | XTN26+5JFZ | Tapping Screw ⊕2.6×5 |
| ng 2.5φ | M 79 | XNG26E | Nut 2.6φ | M 91 | QHQ1161 | Step Screw |
| utton Assembly | | | | M 92 | XTN26+10B | Tapping Screw ⊕2.6×10 |
| | M 80 | XSN26+8 | Screw ⊕2.6×8 | M 93 | XTB2+10BFN | Tapping Screw ⊕3×10 |
| Angle | M 81 | QML3972 | A.T.S. Lever | M 94 | XSN3+8S | Screw ⊕3×8 |
| ism Cover | M 82 | QTWM0039 | Insulating Plate | M 95 | XWA3B | Washer 3φ |
| ly | M 83 | QMA4545 | Side Angle-L | M 96 | QBK7126 | Washer |
| e Holder | M 84 | QMA4546 | Side Angle-R | M 97 | XTN2+6B | Tapping Screw ⊕2×6 |
| Spring | M 85 | QML3973 | Obstruction Lever | M 98 | XTV3+8BFN | Tapping Screw ⊕3×8 |
| pring | M 86 | QBC1244 | Stop Rod Spring | M 99 | XTV3+10BFN | Tapping Screw ⊕3×10 |
| | M 87 | QBT1580 | Stop Lever Spring | M 100 | XTN2+8B | Tapping Screw ⊕2×8 |



# CABINET PARTS LOCATION




| Ref No. | Part No. | Part Name & Description |
|---|---|---|
| G 3 | QYKM0014S | Slide Knob |
| "Silver Type" | QYKM0014K | Slide Knob |
| "Black Type" | | |
| G 4 | QYKM0015S | Slide Knob Guide |
| "Silver Type" | QYKM0016K | Slide Knob Guide |
| "Black Type" | | |
| G 5 | QYQM0001 | Push Button Rod |
| G 6 | QMAM0155 | Angle (for S2) |
| G 7 | XSN3+6S | Screw ⊕3×6 |
| G 8 | XWA3B | Washer 3φ |
| G 9 | QTHM0018 | Cooling Body |
| G 10 | XSN3+10S | Screw ⊕3×10 |
| G 11 | XWC3B | Washer 3φ |
| G 12 | QTWM0038 | Insulating Sheet |
| G 13 | QTSM0077 | Shield Board (for FL Meter) |
| G 14 | QTSM0078 | Shield Board (for Volume) |
| G 15 | QMAM0156 | Angle (for MIC Jack) |
| G 16 | QNQ1070 | Nut (for MIC Jack) |
| G 17 | QTD1164 | Cord Clamper |
| G 18 | QKJM0097 | Meter Reinforcement Angle |
| G 19 | QMAM0157 | Transformer Holding Plate |
| G 20 | QKJM0101 | Dolby Switch Rod |
| G 21 | QKJM0098 | Line Guide |
| G 22 | QKJM0099 | Switch Shelter |
| G 23 | QGOM0111 | Push Button (for Dolby/Music Select) |
| G 24 | QKJM0100 | Filter (for FL Meter) |
| G 25 | QKJM0077 | Socket Plate |
| G 26 | QTSM0079 | Earth Plate |
| G 27 | XTN26+5B | Tapping Screw ⊕2.6×5 |
| G 28 | XTN3+8B | Tapping Screw ⊕3×8 |
| G 29 | XTN3+10B | Tapping Screw ⊕3×10 |
| G 30 | XTN3+12B | Tapping Screw ⊕3×12 |
| G 31 | XTB3+12BFN | Screw ⊕3×12 |
| G 32 | XSN3+6S | Screw ⊕3×6 |
| G 33 | XTN3+8B | Tapping Screw ⊕3×8 |
| G 34 | XWG3 | Washer 3φ |
| G 35 | QYFM0061S | Cassette Lid Assembly |
| "Silver Type" | QYFM0061K | Cassette Lid Assembly |
| "Black Type" | | |
| G 36 | QYBM0047 | Bottom Cover Assembly |
| G 37 | QGCM0068 | Case Cover |
| "Silver Type" | QGCM0068K | Case Cover |
| "Black Type" | | |
| G 38 | QHQ1324 | Screw |
| "Silver Type" | QHQ1324K | Screw |
| "Black Type" | | |
| G 39 | XTB3+10BFN | Tapping Screw ⊕3×10 |
| G 40 | XTB3+8BFZ | Tapping Screw ⊕3×8 |
| G 41 | QGSM0189 | Main Name Plate |
| G 42 | QKJM0086 | Angle (for J7) |
| G 43 | QTD1315 | Cord Clamper |
| G 44 △ | QTF1054 | Fuse Holder |
| G 45 | SJT777 | Terminal |
| G 46 | QSIFL00SF | FL Meter |
| G 47 △ | SJA151 | AC Power Cord |
| G 48 | QMAM0158 | Reinforcement Angle |
| G 49 | QTD1319 | Cord Bind Metal |
| G 50 | XTB3+10BFN | Tapping Screw ⊕3×10 |
| G 51 | XSN3+8BVS | Screw ⊕3×8 |
| G 52 | XTB3+10BFZ | Tapping Screw ⊕3×10 |
| G 53 | XTN3+16B | Tapping Screw ⊕3×16 |
| G 54 | XTS3+14B | Screw ⊕3×14 |
| G 55 | QTD1001 | Lug Terminal |

## ACCESSORIES

| | | |
|---|---|---|
| A 1 | SHE135 | Fixing Pin |
| "Silver Type" | SHE135-1 | Fixing Pin |
| "Black Type" | | |
| A 2 | XZB24X34A04 | Polyethylene Bag (for A3) |
| A 3 | QQT3431 | Instruction Book |
| A 4 | QFC2162 | Synchro REC cord |

## PACKINGS

| | | |
|---|---|---|
| P 1 | QPNM0199 | Inner Carton |
| P 2 | QPAM0057 | Cushion |
| P 3 | QPAM0058 | Spacer |
| P 4 | QPSM0009 | Pad |
| P 5 | XZB40X50A02 | Poly Sheet (for Unit) |
| P 6 | QPQ1052 | Poly Sheet (for AC Power Cord) |

## REPLACEMENT PARTS LIST

Important safety notice
Components identified by △ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

| Ref No. | Part No. | Part Name & Description |
|---|---|---|
| **CABINET PARTS** | | |
| G 1 | QYMM0096K | Main Case Assembly |
| G 2 | QYPM0069S | Front Panel Assembly |
| "Silver Type" | QYPM0069K | Front Panel Assembly |
| "Black Type" | | |



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